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Original Contributions.

ADVANCE AND RETROGRESSIVE EVOLUTION.

BY EUGENE S. TALBOT, M. S., D. D. S., M. D., LL.D., CHICAGO.

(Concluded from August issue, p. 765.)

Next to the ears the jaws and teeth (as is to be expected from the variability of these organs in allied animals) are most affected by degeneracy. This is particularly true of the vertebrates, especially the mammals, as might have been anticipated from their phylogeny or line of descent. At the head of the vertebrates is man; at the foot is the lancelet (amphioxus), most akin to the semi-vertebrates, the ascidians, which in their larval phase are higher than when adult and the life history of which excellently illustrates that potent phase of evolution—degeneracy (Ray Lankester, Degeneracy a Phase of Evolution). In the lancelet the mouth is well guarded against the intrusion of noxious substances, which have to pass through a vestibule richly provided with sensitive epithelial cells resembling the taste buds of the human mouth. There is no heart. In this the lancelet is lower than the ascidians, the insects, crustacea and many mollusks. It approximates the worms, which, despite a very elaborate vascular system, are destitute of a heart, the function of which is performed by contractile blood-vessels. From an embryologic and morphologic standpoint, the proximate ancester of the vertebrate seems to have been a free swimming animal intermediate between an ascidian tadpole and the lancelet, while the primordial ancestor was a worm-like animal organized on a level with the starfish. The vertebrates, embryologically, develop from the amphioxus to the lampreys, thence to the cartilaginous fish (shark), to the amphibia (frog, toad, axolotl), to the reptiles, to the oviparous mammals (duckbill and spiny ant-eater), to the lemurs, and through forms like the pithecanthropus erectus to man.

The present study will be confined to the mammals, passing from the simple types of teeth found in that oviparous edentate, the spiny ant-eater (echidna) of Australia, to the indeciduous ancestors of the sloths and armadilloes and their descendants, inclusive of the dolphins and whales, whose teeth, both in fetal Greenland and adult sperm-whale, preserve this old type. The whales,

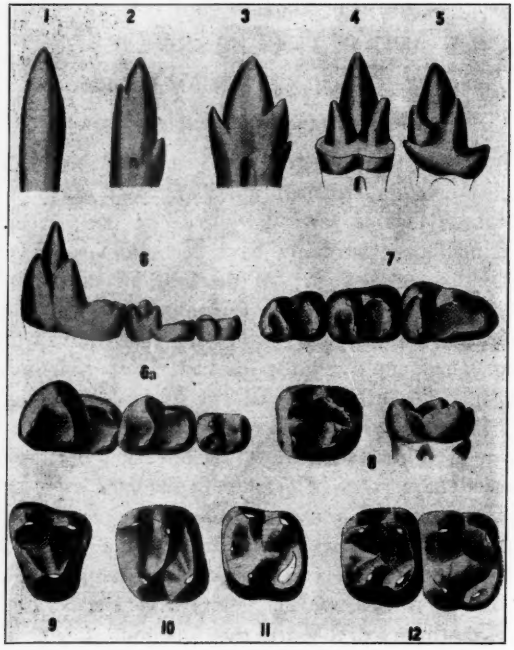

PLATE A.

it should be remembered (Haeckel, History of Creation, Vol. II, p. 242), here degenerated from the hoofed mammals to suit their environment. While as in edentates, these teeth may be few, they may also (as in the insectivorous marsupials) approximate those of the reptilia in number (sixty or seventy on a side) and characteristic location.

The evolution of this primitive tooth to the bicuspid and molar has been explained by two theories—the concrescence and the

differentiation. The first, advanced by Magitot in 1877, was later advocated by Schwalbe, Carl Röse and Kurkenthal. The last was offered by Osborn and Cope. The concrescence theory (Talbot, Degeneracy, Its Causes, Signs and Results) is bringing together several isolated teeth and forming bicuspids and molars. A number of conical teeth in line as they lie in the jaw of the whale represent primitive dentition. In the course of time a number of these teeth would become clustered together in such manner as to form the four cusps of a human molar, each one of the whale-tooth points taking the place of one of the cusps of the mammalian tooth—in other words, by a concrescence four teeth

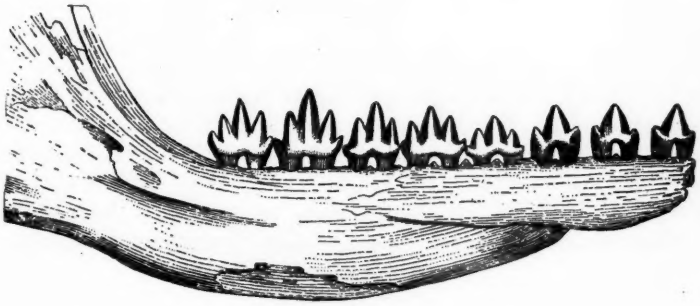

PLATE B.

would be brought into one so as to constitute the four cusps of the molar crown. Vertically succeeding teeth might also be grouped. Now what evidence is there in favor of this theory and what is there against it? First, there is this, that all primitive types of reptiles from which mammalians have descended, and many existing mammals, as we have noted, have a large number of isolated teeth of a conical form; second, we find that by a shortening of the jaw the dental fold or embryonic fold, from which each of the numerous tooth caps is budded off in the course of development, may be supposed to have been brought together in such manner that cusps which were originally stretched out in line would be brought together so as to form groups of a variable number of cusps, according to the more or less complex pattern of the crown.

The differentiation theory is the addition of cusps to the conical tooth. Going back over ten millions of years in the Triassic we

find the mammalia, or the first animals which we can recognize as mammalia, possessing conical, round, reptilian or dolphin-like teeth. There are also some aberrant types which possess complex or multituberculate teeth.

"These teeth begin to show the first traces of cusp addition. In Plate A, Figures 1 and 2, the teeth of the dromatherium of the coal

FIG. 20.

beds of North Carolina occur on the sides of the main cone cusps or rudimentary little cusps. On either side of the main cone are two small cusps. In the same deposit occurs another animal represented by a single tooth (Plate A, Figure 3) in which these cusps are slightly larger. These cusps have obviously been added to the side of teeth and are now growing. In teeth of the Jurassic

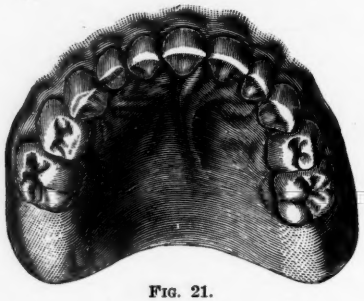

FIG. 21.

period, found in large numbers both in America and in England, but still of very minute size, are observed these same three cusps. These cusps have now taken two different positions; in one case they have the arrangement presented in Plate B. The middle cusp is relatively lower and the lateral cusps are relatively higher, in fact, these cones are almost equal in size. These teeth are termed triconodont, as having three nearly equal cones. But associated

with this is the spalacotherium, the teeth of which are represented in Plate A, Figure 4. Here is illustrated the transformation of a tooth with three cusps in line into a tooth with three cusps form-

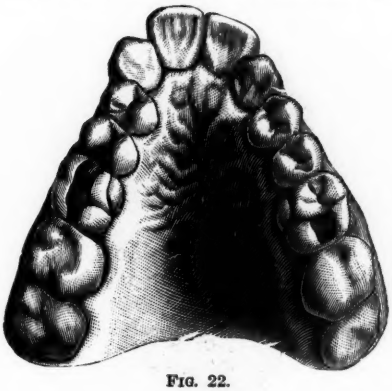

FIG. 22.

ing a triangle. Here the primitive cusp is the apex of a triangle of which the two lateral cusps are the base. This tooth, in this single genus, is the key of comparison of the teeth of all mam-

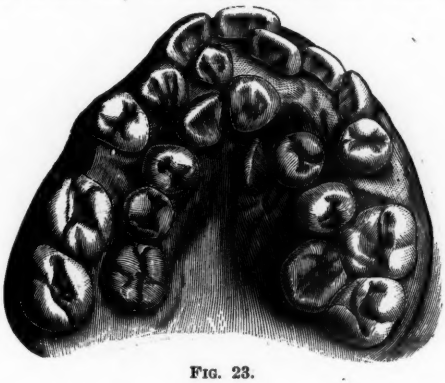

FIG. 23.

malia, and by this can be determined that part of a human molar which corresponds with a conical reptilian tooth. This is the triangle stage, and the next is a development of a heel or spur upon this triangle (see the amphitherium, Plate A, Figure 5). The opossum still distinctly preserves the ancient triangle. Look

at it in profile, inside or top view, and see that the anterior part of the tooth is unmodified. This triangle is traceable through a number of intermediate types.

FIG. 24.

"In Miacia (Plate A, Figure 6), a primitive carnivore, is a high triangle and a heel; looked at from above (Plate A, Figure 6a) the heel is seen to have spread out so that it is as broad as the

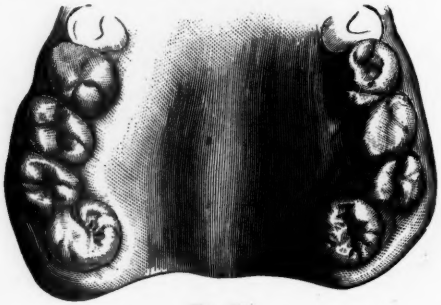

FIG. 25.

triangle. The three molars of this animal illustrate a most important principle, namely, that the anterior triangle portion of the crown has been simply leveled down to the posterior portion. These three teeth form a series of intermediate steps between a most ancient molar and the modern molar of the human type,

and the second tooth is half way between the first and the third. The second molar, seen from above, has exactly the same cusps as the first, so it is not difficult to recognize that each cusp has been directly derived from its fellow. The third tooth of the series (Plate A, Figure 7) has lost one of the cusps—of the

FIG. 26.

triangle. It is now a tooth in which only half the triangle is left on the anterior side and with a very long heel. That tooth has exactly the same pattern as the human lower molar (Plate A, Figure 8), the only difference being that the heel is somewhat more prolonged. These teeth belong to one of the oldest fossil mon-

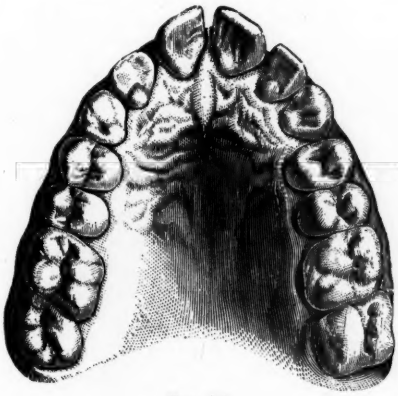

FIG. 27.

keys, anaptomorphus. Human lower molars not infrequently have five cusps instead of four, and the fifth always appears in the middle of the heel or between the posterior lingual and the posterior buccal. This occurs in monkeys and other animals, but no record exists of the ancient anterior lingual reappearing. The human lower molar, with its low, quadrituberculate crown, has

hence evolved by addition of cusps and by gradual modeling from a high-crowned, simple-pointed tooth."

Human teeth are of excellent service in the initial determination of retrogressive evolution in the child, and for this purpose they

FIG. 28.

should be studied from the first evidence of their development until they are all in place, which occurs normally in most cases by the twenty-second year. Man in the present stage of evolution has twenty teeth in his temporary and thirty-two in his permanent set. Any deviation in number is the result of embryonic change

FIG. 29.

occurring between the sixth and fifteenth week for the temporary teeth and the fifteenth week and birth for the permanent. The germs of teeth which erupt late in life and are called third sets of necessity appear before birth and are completely formed at the beginning of the second year, although they remain protected in

the jaw until eruption. More than twenty teeth in the temporary or thirty-two in the permanent set are hence an atavistic abnormality. From the maxillary and dental standpoint man reached his highest development when well-developed jaws held twenty temporary and thirty-two permanent teeth. Decrease in the number of teeth meant, from the dental standpoint, degeneracy, although

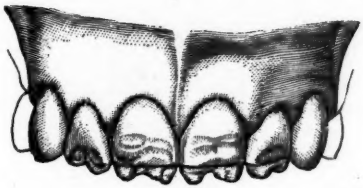

FIG. 30.

it might mark advance in man's evolution as a complete being.

In the New Mexican Lower Eocene occur monkeys like the lemuravus and limnotherium, each the type of a distinct family. The lemuravus, most nearly allied to the lemurs, is the most generalized monkey yet found. It has forty-four teeth in continuous series above and below. The limnotherium, while related to the lemurs, has some affinities with the American marmosets. These solved the problem of the origin of extra teeth (known as super-

FIG. 31.

FIG. 32.

FIG. 33.

numeraries) that sometimes occur in man, and demonstrated that man during his evolution from the lowest monkey lost twelve teeth. These supernumerary teeth are a return to the lemurs. They assume two forms—they either resemble the adjoining teeth or are cone-shaped. While they are rarely exactly counterparts, every tooth can be duplicated (Talbot, Irregularities of the Teeth), as the following illustrations show. Figure 20 shows fairly well deformed duplicate central incisors, the normal incisors being outside the arch. They are crowded laterally by the large roots of the

supernumerary incisors. Figure 21 shows an extra right upper lateral in a temporary set, which is always found in the dog, and extra laterals are often seen in the permanent set. Figure 22 illustrates a jaw without laterals. Figure 23 shows normally de-

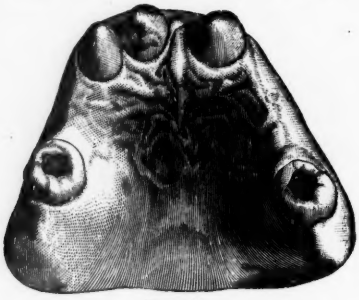

FIG. 34.

veloped supernumerary cuspids which are all grouped together upon the right side, the bicuspids being duplicated on either side; indeed, all the teeth but the molars are duplicated, and are a return to the Port Jackson shark, the dogfish, etc. Figure 24. Figure 25 shows supernumerary third molars easily demarcated from the

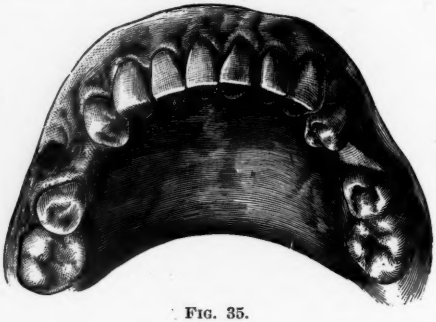

FIG. 35.

normal molars. The teeth which fail to approximate their normal neighbors assume the cone-shape of the primitive tooth.

The fact that the cone-shaped tooth, as a rule perfect in construction, is found everywhere in the jaw, but especially in the anterior and posterior part of the mouth, is of much value in outlining tooth and jaw evolution, especially in the degeneracy phase.

The upper jaw, being an integral part of the skull and fixed, is of necessity influenced by brain and skull growth, hence degeneracy is more detectable in it than in the lower.

The evolution of the jaw is toward shortening in both directions, and this shortening will continue so long as the jaw must be adjusted to a varying environment. The jaw of man having originally contained more teeth than at present, lack of adjustment to

FIG. 36.

environment produces, from the shortening, degeneracy of the jaw and atavism of the teeth. While these may coincide with the general advances of the individual, they indicate that he is not yet adjusted to his new environment. The shortening of the upper jaw causes supernumerary, cone-shaped teeth to erupt in mass at the extreme ends of the jaw.

Figure 26 shows three supernumeraries—a cone-shaped tooth between the centrals; the laterals and cuspids out of position; the left permanent lateral at the median line; another cone-shaped tooth in the vault, and the supernumerary left lateral in place. As

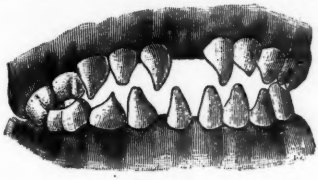

FIG. 37.

many as eight are at times to be observed in the anterior vault. These teeth are most often found in connection with the third molars, usually on a line with other teeth and posterior to the last molar. Supernumerary teeth are not confined to these localities, but may be observed at any point in the arch. The primitive cone-shaped tooth is rarely observed in the lower jaw, and in thirty-five years' practice I have not seen a case. The mobility of the lower jaw prevents that maladjustment to environment present in the upper. The continual shortening of the jaw in both

directions causes the third molars frequently to wedge in between the angle of the jaw and the second molars, so that eruption is difficult, if possible.

The third molar is often absent in the English-speaking and Scandinavian races, and in forty-six per cent of six hundred and seventy patients it was missing. Frequently its development is abortive, and this tooth seems destined to disappear in the struggle for existence. It is more frequently absent from the upper than the lower jaw, and when missing or badly developed the jaw is smaller, and often irregularities, nasal stenosis, hypertrophy of nasal bone and mucous membrane, adenoids and eye disorders co-

FIG. 38.

exist. In Figure 27 both third molars are seen to be missing.

Anteriorly the lateral incisors are most often wanting, and fourteen per cent of them were wanting in six hundred and seventy patients. In the process of evolution man has lost one lateral upon either side of the mouth, and the second lateral also seems destined to disappear? Not infrequently does it occur that centrals, cuspids, bicuspids and even molars are absent, even their germs not being detectable, which is a sign of advance in evolution. Absence of the teeth indicates lack of development of germs, due either to heredity or to defective maternal nutrition at the time of conception or during early pregnancy.

Crescent-shaped, bituberculate, trituberculate, and all deformed teeth tend to the cone-shape. The malformation of these teeth re-

sults from trophic change in dentin development before birth. It consists in dwarfing and notching the cutting and grinding edges of the second set, a familiar example of which is seen in the so-called Hutchinson's teeth, usually referred to a syphilitic etiology. Hutchinson's position has, however, been more strongly stated than his words justify, since he admits that in at least one-tenth of the cases luetic etiology could be excluded (American System of Dentistry). Lues plays only the part of a diathetic state

FIG. 39.

profoundly affecting the maternal constitution at the time of dentin development. While these teeth may be due to the secondary results of lues, they do not demonstrate their luetic heredity.

In Figure 28 (American System of Dentistry) are seen the teeth of an individual affected with very marked constitutional disease. The degrees of pitting will depend as a rule upon the severity of the constitutional disorder, but in the case just cited, although nutrition was but slightly disordered, each tooth showed a tendency to assume a cone-shape. Not infrequently cavities are extended through the tooth. The cusps of the (permanent) first molars calcifying at the first year are usually attacked also and

arrested in development, producing the cone-shape. These data, together with the dates of eruption of the temporary and permanent teeth, furnish an absolute basis for calculation as to excessive or arrested development of tissue.

Figure 29 shows a very degenerate jaw with cone-shaped malformed bicuspids. The right lateral is missing, the cuspids are erupting in the vault, and the arch is assuming a V-shape. The jaw as a whole shows marked arrest in development.

Figure 30 shows Hutchinson's teeth. Were the first molars visible they would present marked contraction of the outer sur-

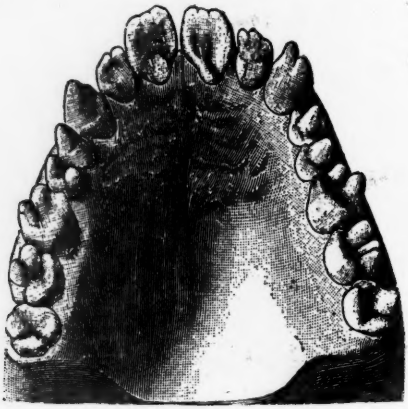

FIG. 40.

face, with a malformed center—a tendency to take the cone-shape.

Figures 31, 32, 33, and the molars in Figure 34 exhibit malformations, and assume the cone-shape and the center frequently associated with this type of teeth. The coincidence in form between Hutchinson's and malformed teeth and those of the chameleon demonstrates that tropho-neurotic change produces atavistic teeth.

Figure 35 illustrates the tendency of human bicuspids to rotate one-fourth of the way around when there is no antagonism, thus again demonstrating the atavistic tendency toward the teeth of the chameleon.

Figure 36 (Smale and Colyer) exhibits extreme atavism; all teeth anterior to the molars are cone-shaped; the third molars are

missing and would probably never have erupted. In Figure 37 (Smale and Colyer) appears more marked atavism; the upper and lower anterior teeth are cone-shaped, and the superior first bicuspid exhibits a tendency thereto; the right superior second bicuspid, right inferior second biscuspids, and the second and third molars are missing. The same condition probably exists on the left side.

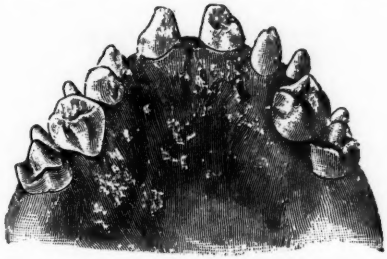

FIG. 41.

The space in the upper jaw is due to the insufficient width of the teeth. Alternation of teeth in the upper and lower jaws is a reptilian feature. Figure 34 furnishes an excellent illustration of the principles previously advanced.

In degenerate jaws the influence of the factors of the differentiation theory are also demonstrated. Every tooth in the jaw at one point or another may display rudimentary cusps. On the

FIG. 42.

FIG. 43.

FIG. 44.

FIG. 45.

FIG. 46.

incisors they are always to be found on the lingual surface. Figure 38 illustrates the centrals with two rudimentary cusps, the laterals with one, and the cuspids with one. Figure 39 represents cusps upon the lingual surfaces of the molars. The cuspids are not unlike the lower bicuspids with a rudimentary lingual cusp.

Thompson remarks that there is a gradation from the central incisors toward the bicuspids in evolution. This grading of form is not observed in the passage from the cuspid to the bicuspid in

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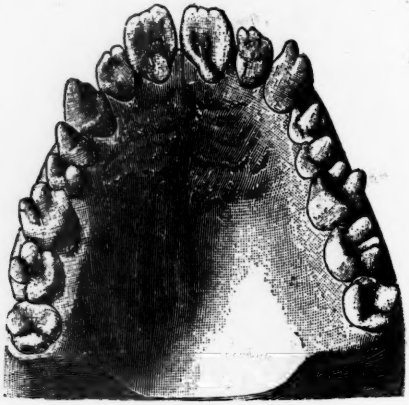

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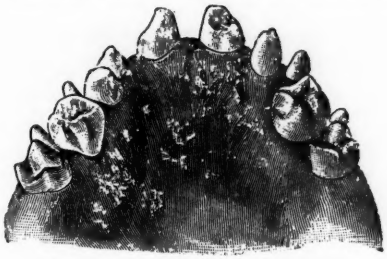

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man, but it should be remembered that the cuspid often presents a cingulum on the lingual face that inclines it toward the bicuspid forms in lower mammals, like the mole, and that the first bicuspid is then more cuspidate in form, the inner tubercle being much reduced. This tubercle is variable and even erratic as to its position; it appears as far forward as the centrals and is often present

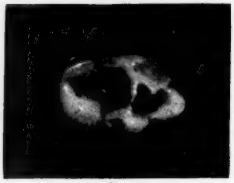

FIG. 47.

on the lingual face of the laterals of man. The lingual tubercle is very constant on the first bicuspid of man and is as well developed as the buccal, but in some lower forms, as the lemurs, it is quite deficient, and it attains the highest development only in the anthropoids and man. Considering these stages of development, the grading from the cuspid to the bicuspid forms was more grad-

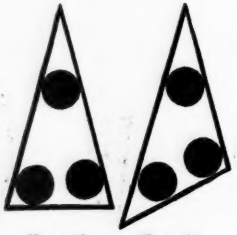

FIG. 48. FIG. 49.

ual in the earlier species than in the later, where the individual teeth have taken on special development (*Cosmos,* May, 1894).

The skull of a degenerate girl, who died from tuberculosis at thirteen years, has among other stigmata a cusp on the external surface of a right inferior cuspid. This is a decidedly strong point in favor of the differentiation theory. Another strong example in its favor occurs in Figure 40 (Smale and Colyer), where every tooth is present and a most remarkable display of cusps occurs.

The cusps upon the cutting and grinding edges are not obliterated. Commencing with the left superior central incisor, three cusps are present with a rudimentary palatine cusp. The laterals also show three cusps, while the cuspid has two very distinct ones. The first and second bicuspids have tubercular cusps, they being in line. The buccal cusps upon the molars vary from two to three and are still in position, but the palatine cusps are worn away. The same is the case upon the opposite side, except that the cuspid has cusps that have fused together, leaving a small projection upon the mesial side and a rudimentary palatine cusp. The cusp upon the third molar is lost. In another case (Figure 41, Smale and Colyer) the primitive cone teeth are seen trying to shape themselves into incisors. The lateral incisors, cuspids and bicuspids are still cone-shaped; the first permanent molar is fairly well formed, while the second molars are still in a primitive condition. The points made by Osborn are fully demonstrated in the last two illustrations—namely, the triangular-shaped crowns and the leveling of cusps.

There is abundant evidence to show that degenerate teeth unite in twos, threes, fours and fives, as indicated in the concrescence theory, and these single cone-shaped teeth grow together and form bicuspids and molars. The germs of any two normal teeth may intermingle and unite; not only are the crowns found united with separated roots, but crowns and roots are united throughout. Figures 42 and 43 show a superior central and lateral incisor joined together throughout the entire length of crown and root. Figure 44 illustrates two lower incisors which are united throughout. Figure 45 shows a cuspid with two roots. Dr. George T. Carpenter of Chicago has a right superior second bicuspid with three well-formed roots. Figure 46 illustrates two bicuspids united at the crowns. It is not uncommon to find three molars united together, as the second, third and supernumerary. Dr. C. V. Rosser of Atlanta, Georgia, has two small molars and a supernumerary cuspid perfectly united from crown to root, and these three are also united to the roots of a well-formed molar. Thus we see the concrescence theory is fully established.

A condition of molar tooth occasionally observed in America, but more often in England, Scotland and Ireland, is that where the crown is flattened from side to side (Figure 47) and the roots are

nearly or quite on a line; instead of being normal, like Figure 48, they stand like Figure 49 (*Dental Review*). The third molar is usually affected. These teeth are usually found in degenerate jaws, and like most abnormalities observed in same they are atavistic, reverting in crown and roots to the original triconodont type with cusps and roots in line. The roots are sometimes separated, containing two or three, or there may be only one flattened upon the sides.

Dr. S. H. Guilford was the first to call attention to this particular anomaly, in the American System of Dentistry, page 416, under the heading "Compressed or Flattened Crowns." He says, "Among the anomalies of tooth structure or formation this one is very rare. The crowns of this character are flattened in the antero-posterior direction, so that their diameter transversely of the jaw is by far the greater one. The fissures or sulci, instead of presenting the usual form, are distorted and sigmoid in shape, corresponding with the long diameter, while the cusps resolve themselves into narrow ridges somewhat after the manner of the molars of the ruminantia. The third molars of the superior arch are the ones usually affected, although the writer has seen one case in which the superior first molar presented the same condition."

William Booth Pearsall of Dublin, Ireland, called attention to this abnormality at the 1888 meeting of the Royal College of Surgeons, Ireland (*Dental Review*, January, 1899). The question arose in connection with extraction, since there was difficulty in seizing the tooth with the forceps because of the shape of the crown and roots.

In degeneracy is peculiarly well illustrated the operation of the law of economy of growth, producing arrested and excessive development as seen in edentulousness and excessive dentition. As Darwin points out, hairless dogs have imperfect teeth, the dermic defects affecting the animal as a whole, and other organs profiting by the deficiencies of the hair and teeth. In most cases of hairy men there is, as Magitot remarks, defective or irregular dentition. Here the struggle for existence (which has been between the teeth, which are derived, as elsewhere shown, originally from the skin) is now between the teeth and hair. In the case reported by Thurman, a man fifty-eight years of age, who was almost devoid of hair all his life, possessed only four teeth. There was absence of sensible perspiration and tears. The skin was peculiar in its delicacy, thinness,

softness and absence of pigmentation. The hair on the crown of the head and back was very fine, short and soft, and in quantity about like that of a three months infant. A similar condition existed in his cousin-german. In a case reported by Williams, a fifteen-year-old girl had scarcely any hair on the eyebrows or head and was destitute of eyelashes. She was edentulous and had never sensibly perspired. "Jo-Jo," the famous "Dog-Faced Boy," had very defective teeth. Borelius found atrophy of all the dental follicles in a woman of sixty who had never possessed any teeth. Fanton-Touvet saw a boy of nine who had never had any teeth. Fox reports a woman who had but four in both jaws. Tomes cites several similar instances. Hutchinson reports a child who was perfectly edentulous as to temporary teeth, but whose permanent teeth duly and fully erupted. Guilford describes a man of forty-eight congenitally and permanently edentulous, who had no sense and was almost without taste. The surface of his body was covered with fine hairs. He had never had visible perspiration. Otto observed two edentulous brothers (Gould's Anomalies).

Excessive dentition shows itself in many varieties, especially those which constitute a return to the polyphyodont types of the lower vertebrates. O. Hildebrand of Gottingen, Germany, in 1889 reported (*Medical and Surgical Reporter*, July 15, 1890) the case of a child of twelve which after various operations had been relieved of about two hundred teeth of various sizes. Two years later (July, 1891) the patient came under observation at the Gottingen Surgical Clinic. Both sides of the lower jaw were much thickened, as was also the right side of the upper jaw. There were found seventeen teeth, part of them normally developed, others in an undeveloped condition, and their position was deviated and irregular. From the upper and lower jaw there were again some masses removed (which had the same conformation as those extracted in 1889) which represented about one hundred and fifty teeth. There were also found two round glassy bodies about the size of two peas, which upon microscopic investigation showed tooth structure. This is a return to the polyphyodont type from arrest of development very early in fetal life. Beside the supernumerary teeth elsewhere described, arrests of development producing excessive dentition may evince themselves in double rows and in anomalous positions. In the Paris Dental School Museum are several deciduous teeth, both of the superior and

inferior maxilla, fused together. Bloch cites a case where there were two rows of teeth in the superior maxilla. Hellwig has observed three rows of teeth. The Ephemerides contain an account of a similar anomaly. Teeth have been found, as Gould points out, in the nose, orbit, palate, and exceptionally, as in a case reported by Carver, they may grow from the lower eyelid. In Carver's case the number of deciduous teeth was normal. Although the supernumerary tooth was a cuspid, it had a somewhat bulbous root.

Arrest of development proceeding from a check at the senile period of fetal life may evince itself in senility of the alveolar process, as in a case reported by Bronzet, where a child of twelve had but half its teeth, the alveolar process having receded as in old age. Such arrest of development may also produce polyphyodont conditions in the human being. Catching reports (Boston Medical and Surgical Journal, July 10, 1887) the case of a girl who had all her teeth at six months and shed them at nine. At fifteen months she had a full set once more, and in six weeks these were shed. At two years and a half she again had a full set, which remained until her fourth year, when came another. This remained until another set began to erupt at eleven and became the permanent set complete at fifteen. This was a reversion to the snake and elephant.

The homology of the dental tissues with the tissues of the true skin, already pointed out, and the special identity of the enamel with the extra vascular appendages, render it certain, as Dr. A. H. Thompson points out (*Dental Cosmos,* Vol. 19, p. 237), that they are governed by the same laws, subject to the same influences and possess the same phenomena of character as the allied tissues. Community of origin and similarity of structure and nature necessarily establish identity in the manner of life, in the methods of maintaining life, with its varied phenomena of similarity of service rendered to the economy, and in the process of dissolution and expulsion from the system. The relationship and homology of the teeth with the skin and its varied appendicular productions are established by demonstration. This can well be true and yet have them preserve the unity of character, which they do not fail to do. Teeth, spines, scales, dermal plates, nails, hair, bristles, horns, hoofs, etc., as varied in form and apparent purpose as tissues can well be, are yet closely related in structure and function, with variations of course within certain limits.

The enamel consists of calcified epithelial cells elaborated for the endurance of an appointed work and service in the economy. Enamel, like epithelium and corneous structures, yields, as A. H. Thompson remarks, keratin. In structures so unstable in evolution as the teeth, arrest of development would tend to produce for this reason a reversion to horny structures in place of enamel. Indeed, this occurs physiologically in certain vertebrates. In that oviparous mammal, the duck-bill, true teeth appear in the embryonic state, to give way later, by what Thompson calls suppressive economy or the degenerative results of the struggle for existence between the organs, to horny structures. The same condition must have appeared when the toothed birds began to lose their teeth in the Tertiary. Arrests of development in man may therefore produce what is seemingly a reversion to this condition of the duck-bill. As has already been pointed out, neurotic cases occur in which, from arrests of development, there is very little enamel upon the teeth.

It is not uncommon to occasionally find an adult with large, well-developed jaws, containing thirty-two teeth with broad short crowns, short-spreading roots, low vaults, short alveolar processes, dense enamel and no decay. A tooth brush has never been used, there is no tartar, and the gums are healthy. This is a marked atavistic illustration.

The following books and articles are recommended for reference:

1. Brains of Criminals, C. K. Mills, Journal of Nervous and Mental Diseases, 1886.

2. Genius not a Neurosis, Kiernan, Alienist and Neurologist, 1892.

3. Transformation of Heredity, Kiernan, Medicine, 1898.

4. Degeneration Stigmata as the Basis of Morbid Suspicion, Kiernan, Alienist and Neurologist, 1898-1901.

5. Odor in Pathology, Kiernan, Doctor's Magazine, 1900.

6. Maternal Impressions, Kiernan, Medicine, 1900.

7. Heredity, Kiernan, Medical News, July 5, 1901.

8. Intrauterine Periods of Stress, Kiernan, Medicine, 1901.

9. Mixoscopic Adolescent Survivals, Kiernan, Alienist and Neurologist, 1903-1905.

10. Somatic Etiology of Insane, E. C. Spitzka.

11. Adolescence, Stanley Hall.

12. Man and Woman, Havelock Ellis.
13. The Criminal, Havelock Ellis.
14. Psychology of Sex: Sexual Selection, Havelock Ellis.

BENEFITS OF POST-GRADUATE COURSES.

BY A. C. RUNYAN, D. D. S., SOUTH HAVEN, MICH. READ BEFORE THE SOUTHWESTERN MICHIGAN DENTAL SOCIETY, AT KALAMAZOO, APRIL 11-12, 1905.

The benefits of post-graduate work cover a rather large subject, and embrace so many points of interest that I find it difficult to incorporate them all in one short article. However, I will mention some of them and suggest others that may lead to discussion. There are several present who have taken post-graduate work at the university, and I should be pleased to hear from them, as I desire the matter discussed from all standpoints. As for myself, I can speak only of the benefits which I have experienced.

What I consider one of the principal advantages is that it gives the practitioner the benefits of the experience of a specialist along some particular line of practice or research, who imparts not only the knowledge he has acquired but also a part of his personality and enthusiasm.

While our journals and societies keep us posted and thoroughly abreast of the progress of our profession, and we may by hard labor and many failures work out for ourselves the required results, it is far more satisfactory, and cheaper from a financial standpoint, to get your inspiration from the fountainhead.

There are several reasons for this, but the principal one is, that it matters not how thoroughly an operation may be described, or how minutely the modus operandi may be written, there are little features of technique that are entirely lost, and very often they may be the features essential to success.

There is another important point in post-graduate work which must not be overlooked. You are brought into immediate contact with the most progressive spirits from all parts of the country, who have come on the same errand as yourself, so that you not only get that which you pay for in the school of instruction, but you reap the benefit of the experience of these men on many different subjects. The practitioner who will take the time and money to im-

prove himself in some special line of work is usually a man that no other practitioner can meet without being benefited professionally at least. The inspiration imparted by a body of keenly interested men, who have come by experience to thoroughly know what they need, will acomplish more in the two or four weeks usually given to a post-graduate course than many of us did in the same number of months in our school work.

Then there is the social feature, particularly if there are several rooming or boarding at the same place. All are benefited by telling of the pleasant, and sometimes not so pleasant, experiences of the everyday routine of office practice. This of course is only incidental, but they all go toward the general benefits derived. There are some who feel that they cannot afford the time and money, but if you will put it in the way of a vacation you will receive all the benefits that a vacation would give you, spend less money, and return to your practice with new inspirations. You will certainly have a greater regard for your chosen profession and be better prepared to serve your patrons. Consequently you are a better man in every particular. I think that those dental colleges which have established post-graduate courses along special lines have taken a wise step, and their alumni and others may come and renew their youth and gather new inspirations. By availing ourselves of this privilege we shall make progress and never grow stale, and the standard of our profession will be elevated above the plane of commercialism and quackery.

DISCUSSION.—*Dr. A. S. Rowley:* As old a practitioner as I am, I should welcome such an opportunity to refresh my knowledge. The old men need such things, as the essayist says, to keep them up to date and from falling into routine practice. My experience suggests that many young practitioners need it badly, as they fail to take advantage of their opportunities when in college, and are not capable of doing some of the more commonplace operations. After a student has practiced for a year or so he begins to find out what he does not know and ought to have learned while he was in college, and an opportunity to do post-graduate work ought to be appreciated by him.

Dr. S. M. White, Benton Harbor: As long as we can keep patients coming our way we don't feel the need of more knowledge. I think one of the best post-graduate courses a young man can have is to attend all the dental societies he can reach. He will get inspira-

tion from the papers and discussions, learn skill from the clinics, and find out what other men are thinking about and doing. No man can profitably to himself or his patients shut himself off from his professional brethren.

Dr. W. W. Scott: I have had a long experience in trying to keep up with the profession by reading and attending society meetings. I don't know as this has been the reason why I have held my patients, but I believe it has had much to do with it.

Dr. T. G. Rix, Dowagiac: It has been my practice for forty-seven years to attend every dental gathering I could reach where there was a prospect of learning something. I am still young enough to take a post-graduate course and may do so. I have always had associated with me young men, generally college graduates. Sometimes they have known much more than I, and occasionally I have been able to instruct them a little. I have always made it a practice to learn all I could from every source, because it is very useful to know things, and you never know when you will be called upon to do something unusual. Association with members of the profession is in every way helpful and ought to be encouraged.

Dr. E. A. Honey: I suspect some men who are oversensitive fear it would be an acknowledgment of inefficiency to have it known that they had gone off to school again, but this is a very erroneous idea. I recently took the post-graduate course in porcelain work at the university and feel greatly repaid for the time and money it cost me. You can't get into such work with a lot of earnest men without receiving benefit, and it will usually be in proportion to the interest one takes and the earnestness with which he employs his time. One can't very well avoid getting helpful suggestions and new inspirations. Post-graduate work is a means of advancing our technical knowledge and skill that we ought to encourage.

Dr. C. H. Worboys, Albion: Like the previous speaker, I took the porcelain course, and like the boy with the pie, "It tasted so good that it sounds like more." We had a two-weeks dental meeting with clinics all the time. We visited and worked both day and night, and no subject was left undiscussed. Everyone seemed to know something he was glad to tell, and we were all just as eager to hear of it and approve or disapprove, as the case might be. We had clinics and were not afraid to work before each other and have our work inspected by the professors or anyone else. We made

failures and learned valuable lessons from them, as we had someone to put us right without long series of useless experimentation. I consider it an ideal method of improving one's skill and of getting new ideas and enthusiasm.

Dr. N. S. Hoff: I would say that this course is an effort on the part of the dental faculty of the university to put at the disposal of the profession in this state the facilities used for instructing students. We hope for two things: First, that the profession will show its appreciation by availing itself of this opportunity to secure near home instructions of the highest order in technical affairs for a reasonable fee, which it has never had an opportunity to secure except by going a long distance and obtaining at great expense, and second, that this will result in inspiring practitioners of our state to contest with each other in the attainment of superior skill, so that in time we shall have all the clinicians necessary to demonstrate every new or valuable method in any of our local or state societies without sending abroad to import someone, in order that our meetings may not be failures so far as the clinics are concerned.

HOW MUCH ORTHODONTIA SHOULD THE GENERAL PRACTITIONER DO?

BY MARTIN DEWEY, D. D. S., M. D., GRAND RAPIDS, MICH. READ BEFORE THE SOUTHWESTERN MICHIGAN DENTAL SOCIETY, AT KALAMAZOO, APRIL 11-12, 1905.

The practice of orthodontia is by no means new, as we find the first text-books on dentistry contained chapters on the "correction of irregularities of the teeth," but it is within recent years that we find interest increased to such an extent that any dental journal you may pick up almost invariably contains articles on orthodontia. The cause of this new and increased interest in the subject of orthodontia is the fact that it has established itself as a specialty of dentistry, and no one thing has done more toward establishing orthodontia as a specialty than the organization of the American Society of Orthodontists. When the society was first organized the wiseacres said it could not exist, because orthodontia was too limited a subject to support a society of its own, but the growth of this body has been steadily onward and upward, until we find at

the recent International Dental Congress the section of orthodontia the most successful of them all.

Since orthodontia has established itself as a specialty of dentistry the question naturally follows, "What will be the attitude of the dental profession toward orthodontia in its proper sphere?" Will the profession continue to practice orthodontia in the future as it has in the past and is doing in the present, or will it confine itself to operations in general dentistry for which it is better fitted? Whatever the attitude of the profession may be, it will necessarily be governed by the attitude of the individual practitioner. In other words, "How much orthodontia should the general practitioner do?" To answer this question in a few words I will say, "Not any." My reason for answering in this manner is the fact that orthodontia has been and is yet a neglected subject in the dental college curriculum, and lectures on this subject are generally given by someone occupying some other chair in the college. Those lectures are generally on "How to construct regulating appliances," "the taking of modeling compound impressions," "the extraction of teeth for the correction of malocclusion," and "when and what teeth to extract."

The result of such teaching has been the extraction of any tooth from the third molar to the central incisor. We still find men prominent in the profession advocating extraction of the first permanent molar for the correction of malocclusion of the anterior teeth. The case never did exist in which the occlusion of the anterior teeth was benefited by the extraction of the first permanent molar; not only was there failure to benefit the existing malocclusion, but the patient's facial outline was spoiled and the condition complicated by the production of a malocclusion of the molar region.

We also find the theory of inherited malocclusions is still taught by some men. They claim that the "intermarriage of types," "mixing of races" and the "inheritance of large teeth and small jaws" cause a large percentage of malocclusions. The theory in itself is faulty because the tendency of nature is to harmonize conditions. If we saw such a deformity existing in the teeth and jaws, why would not a like condition exist in other parts of the anatomy? For example, why would you not see large fingers on small hands or large finger nails on small fingers? If the child would inherit large teeth and small jaws, why would you not see equally as many

cases of small teeth and large jaws? The result of this teaching is that dentists have practiced the extraction of teeth for the correction of malocclusions, claiming that the case could not be otherwise treated because of this inherited condition. We even find men have gone so far as to extract some of the anterior teeth for the correction of malocclusion, justifying their acts by claiming the teeth were too large for the arches. Consequently a great deal of harm is still being done by those who are attempting to correct malocclusions by extraction. Not only do they fail to obtain normal occlusions, but the condition is often made worse from the standpoint of an ideal arrangement of the teeth, and they furthermore produce harm by spoiling the facial outline of the patient. It is the seeing so many of these failures, the harm that is being done and the needless sacrifice of teeth that have caused me to say that the general practitioner should abandon the practice of orthodontia as a general rule.

Another reason why he should confine himself to general dentistry is the fact that it is impossible to successfully practice orthodontia in connection with anything else. Like oil and water, they refuse to mix. He will either neglect his general practice or his orthodontia patients. He may set aside certain hours of the day and faithfully promise himself that he will do nothing but orthodontia during that time, but the first thing he knows his general practice has crowded into the period set aside for the treatment of cases of malocclusions. He will have a patient in the chair, making a gold filling, when the orthodontia patient comes in. He cannot ask the first one to sit in the chair with the rubber dam on while he waits on the patient with the malocclusion, so he tells the latter to come back to-morrow, but to-morrow the patient has a ticket to the matinee or other social engagement, so the appointment is lost entirely. The result of this is that the patient becomes discouraged, so the appliance is removed before the case is completed and another failure is recorded.

It is also impossible for the general practitioner to acquire the same technical skill by devoting a few hours each day to the practice of orthodontia that a specialist would by devoting his entire time to it. The former may have a good knowledge of modern orthodontia, but unless he possesses the technical knowledge his operations will necessarily be second class. You have no right to ask your patients to be content with operations in orthodontia which are

not the best any more than you have the right to ask them to be content with second-class work in operative dentistry and crown and bridgework. The general practitioner, not possessing the required skill, will necessarily have to treat cases at a financial loss. It would be dollars and cents to his advantage if he should confine himself to the field of general dentistry, and recommend patients in need of orthodontia work to one who devotes his entire time to the treatment of malocclusions.

However, the usefulness of the general practitioner in orthodontia still exists, and on him depends to a great extent the rapidity with which it will develop as a specialty. His usefulness to the art in the future will be that of advisor. It will be he who will first see the patients suffering from malocclusions, and in order that he may give good advice he must necessarily be familiar with the teachings of modern orthodontia. He must be familiar with normal occlusion, recognize the relation the teeth of one arch bear to the other, and count the temporary teeth as possible factors in the production or prevention of malocclusion in the permanent teeth. He must also recognize patients suffering from nasal obstructions, and advise early treatment of the difficulty so as to obtain the best results from the standpoint of occlusion and facial art. When the dentist becomes familiar with the principles of modern orthodontia we shall see fewer failures, such as the treatment of cases in which the malocclusions of the upper arch have been corrected without any consideration being taken of the lower arch.

The point may be raised that the general practitioner is forced to do some orthodontia because the specialists are too few. Whenever the dental profession shows a greater tendency towards recommending patients suffering from malocclusions to men who devote their entire time to the treatment of such cases, specialists will become more numerous, and until that time the general practitioner who attempts orthodontia should be sure that anything he does will not be of such nature as to produce harm in after years. He must not forget that the so-called simple case of malocclusion in which he sees only a "crooked tooth" is but the sign of some greater trouble, and that a tooth crowded out of the arch is but the symptom of a greater malocclusion. He should avoid extraction for the correction of malocclusions, and all cases which he treats must tend towards the high ideal of normal occlusion and improved

facial outlines, and when he has attained these results he has obtained the best results possible in modern orthodontia.

OUR ANNUAL INCOME AS AN ELEMENT IN DENTAL PROGRESS.

BY B. J. CIGRAND, M.S., D.D.S., CHICAGO. READ BEFORE THE SOUTHWESTERN MICHIGAN DENTAL SOCIETY, AT KALAMAZOO, APRIL 11-12, 1905.

It is the general impression that in our conventions the subjects which pertain to the technic and science of dentistry alone beget or foster progress, and that the advancement of our profession depends entirely on such phases of our tasks as enter into operations on the dental organs and their adjacent parts in the oral cavity. These gatherings are convened for the express purpose of advancing the art and science of dental surgery, and the primal object is to be of greater service to suffering humanity, hence the inference that only such subjects as pertain to the technic or science have any bearing on dental progress. This narrow and generally accepted view has deterred our profession from commanding the cordial consideration to which it by right is entitled.

It is the purpose of this paper to bring to your attention a feature in dental progress which has not attracted in this sense any consideration. The kindred arts, sciences, callings and professions are taking advantage of the so-called spirit of the times and are shaping their destinies to fit the collateral circumstances of universal—not special progress.

Our profession has devoted considerable attention to organizations, associations, societies, clubs and fraternities, calculated to advance the purely scientific side of dentistry. Let us presume that we are a unit as to the etiology of dental caries, that we fully comprehend the causation of pyorrhea, that our knowledge is complete concerning root-canal dressings and that the underlying principles of crown work are fully known. Then let us dispel from our minds all such subject matter as pertains to the technic and practice of dentistry, and consume the time with a theme fully meriting our closest attention. This paper is intended to express in an emphatic manner the necessity of closer fraternalism on the interesting subject of professional remuneration.

This is an age of centralization, and the trend of the times is toward combining forces and uniting energies of a similar character. At no period of civilization has there been expressed so pronounced a purpose of affiliation. Institutions of industry and commerce have recognized the good results growing out of mutual concern, and individuals also discern the benefits of such organizations, hence union of effort has resulted in general uplifting of condition. In fact, this disposition on the part of both corporate and individual enterprise has brought about circumstances which control the growth and progress of every known human effort, our own profession being influenced in countless ways. This spirit of association has ripened to such a degree that union and existence have in many vocations become synonymous terms.

If we as a profession aspire to command public esteem as professional and public servants, we have much yet to accomplish—other than mere technical and ethical proficiencies and standards. Our culture and general behavior in the society and community in which we live will contribute most pronouncedly toward inducing the public to pay us higher financial and social tribute.

The individual, his early training resulting in a clear, positive and admirable character, is an equation of which we must not lose sight. Nature may have endowed him with a force in both physical and mental aspects, which readily places him in a favorable position to command his due of respect, accompanied with a willingness to pay a high compensation; again, he may have by close application improved his heritage and developed such elements as he felt essential for a professional success. By his pursuit of knowledge, which gradually converted his love of art into an admiration of the beautiful, and his eagerness to learn the science of the known, which soon led him to a study of the realms of the unknown, he unconsciously builded within his body and mind a gentle, refined, honest, forceful and proficient professional gentleman. With this acquired manhood he becomes a power, he gathers within him an undescribable control of circumstances, kindred to his training, he gains prestige and wins the favor of the entire community, and in this chronicle of apparent success lies the harvest of real success, for nothing succeeds like success.

The profession to-day is ready for an advance in standards of compensation, and we need not delay longer, as we have attained to a

position in the civic scheme where we are necessary. What next shall we do? The general surgeons of to-day are awakening to the importance of our professional service. Only recently Dr. D. A. K. Steele, the consulting surgeon of the College of Dentistry, University of Illinois, in a conversation assured me of the importance of normal conditions of the mouth in patients awaiting operations on the alimentary tract. He said it was essential to prevent the presence of pathogenic energy in surgical wounds, and that ulcerated or diseased oral tissues or disturbed dental organs which harbored pus contributed this deadly element to the food, and the latter, freighted with these pathogenic organisms, encroached upon the new wound, produced inflammation and the consequent irritation, and not infrequently resulted in death to the patient. Hence he has made it the initial step in his examinations to determine that no such abnormal conditions exist in the mouth, thus avoiding threat ening complications in internal surgery involving the alimentary tract. He even states that he considers an examination of the oral cavity essential to ultimate success.

As further evidence of the high appreciation accorded our calling these words will be welcome: "Joseph Kidd, an eminent English physician and specialist, deals with the cause and cure of appendicitis in a manner and from a point of view which make his observations of exceeding value and interest to the lay reader. Dr. Kidd has had fifty years of extensive practice in London, and it is his testimony that appendicitis was very infrequent until about twenty years ago. As for the causes of the disease, he attributes it often to a chill, but hurried eating and imperfect mastication, he says, are very potent causes. Masticate well, eat slowly, do not swallow any food that is not perfectly softened by the teeth. Even salads, fruit, nuts, raisins may be taken freely if well masticated. In the haste and bustle of city life it is better to take half a meal well masticated than to bolt the whole in a hurry."

All this contributes to the importance of dentistry and augments the value of our services. If other specialists of the mother calling can exact high fees for their services, who in this audience or who of the masses can assign good causes for our failure to deserve better consideration. The financial gain would redound to the welfare of the commonwealth and the public generally.

Statistics prove that the dentist more than any medical specialist

must expend his money liberally if he hopes to keep in touch with the rapid onward strides of his calling; and he more than any of his colaborers in the field of medicine or the art of surgery must be in actual communion with his fellow practitioner. This at first though may not be understood and will very likely be underestimated. Our vocation deals pronouncedly with the mechanical, with the digital, with the manual. With us the fingers must work in concert with the mind. We must idealize, then with our hands realize. The associating with our professional brothers and the coming in contact with their material successes are essential. The benefit of gatherings such as this is fully understood by the progressive, ambitious and earnest dentist. He comes to contribute and to receive; he is here to see how various appliances are adapted, how certain procedures are instituted, how the mechanism is constructed, and what method is applied in obtaining results in harmony with the laws of mastication and basic rules of anesthesia. You may attempt to tell him these things by means of the pen or type, but he will lack the element of procedure and hence will delay attempting a similar task. You cannot transfer manipulative steps, or digital movements, or material changes with any degree of certainty by word pictures. All vocations or tasks with manual skill as their basis are best taught by the eye, hence the failure in teaching the art of violin-playing, or painting or sculpture by correspondence. The operator must exist in your eye; he is the pattern, his every movement is a symbol of product, and the contact and communion with him are the elements which create in you the spirit of progress and accomplishment. The eye and the hand are inseparably associated with dentistry. Hence dentists must expend large sums of money and much time and effort to attend the various dental gatherings, local, state and interstate.

How different with the attorney, the pharmacist, the theologian and even the physician, who can be in touch with the actual progress of their respective professions through the medium of their journals and magazines and reports. Personal contact is not necessary, since the progress and advancement of these professions are devoid of digital dexterity.

The public is the immediate benefactor of this gathering—we are assembled to evolve methods calculated to relieve pain, institute improved appliances and deduce procedures calculated to inaugu-

rate greater comfort and bequeath health and longevity to suffering humanity. As the populace enhance our compensation we endow them with greater blessings.

In operations which demand skill and conscientious attention, as the administration of anesthetics, where the practitioner takes life within his charge, the fee is so insignificant that I will not dignify the price paid by pronouncing it a fee, compensation or remuneration, but stamp the charge by the commercial word price, which has within its meaning the definition of a fluctuating bargain-counter symbol. Could you dream of the lawyer, oculist, surgeon or physician assuming the responsibility of human life at such a paltry sum that it would require four cases to net one dollar. Such a disposition on the part of dental practitioners holds our calling on the low level of a trade. Then we have the subject of root-canal fillings, those distressing, tortuous canals where you waste life force, exhaust your nervous energy, and bring to your entire being, mental and physical, a tedium not yet clearly described in our dental vocabulary. I sometimes think this operation brings a peculiar tired feeling not yet properly named. This trying and painstaking operation for the most part does not receive the consideration of meriting any charge.

The surgeon often performs operations purely within the dental province, yet receives financial consideration decidedly in excess of what the dental practitioner might hope to obtain. Wherein is our equity in such a procedure? Why can the physician and surgeon exact fees for services we have every possible license to perform, and we must submit a bill reduced by a large divisor? When we analyze the previous training and general career of the surgeon or physician, we cannot comprehend the causes for such flagrant discrimination in adjustment of equivalent surgical services. We devote sixteen years to our training—so do they. The percentage of dentists who hold the M. D. degree far exceeds that of physicians who hold the degree of D. D. S. As a profession we are the best qualified and organized—why hesitate to charge?

The question of tenure of service may not appeal to you as being of any importance in registering our equity in the matter of remuneration, but careful study will convince you that the duration of dental service is considerably shorter than that of the other professions. Our hours of work are limited, and all we earn comes from

the chair. In short, we are not able to practice at such an age as the physician and lawyer. We have as our harvest time a period of about fifty years, for granting that the dental student at the age of twenty-one receives his degree, at the age of seventy-one he will have attained to that milestone of life where he can no longer hope to merit the confidence of new clients. His age will have incapacitated him for the finer technic, his eyesight will probably have sustained injuries from the strain accompanying the practice of our specialty, the necessary and constant caution will have provoked a variety of nervous disturbances, and the peculiar position which the dentist must assume at the chair, yielding little exercise, will have inaugurated and aggravated some weakness, so the limit for actual practice is placed at a high figure at seventy-one. Dr. C. Edmund Kells, Jr., of New Orleans, wrote: "The years of advantageous practice of a dentist are comparatively few. With the lawyer and physician each succeeding year but adds to his experience and usefulness, but with the dentist it is quite different, for at the age when either of the others would be in the prime of his profession the dentist is on the decline." This we all accept as the plain truth, hence the dentist must be better paid, since in his years of decline and retirement he will require the means earned in the days of vigor.

Two causes induce the high mortality rate given to our calling: First, position at the chair and confinement in small offices; second, likelihood of infection from consumptive patients. The number of dentists who succumb to tuberculosis is placed at 11 per cent, while lawyers show as low as 8 per cent and physicians barely 7 per cent. Physicians suffer least from nervous ailments, while lawyers register higher and dentists the maximum. These figures demonstrate that our vocation demands fewer hours, longer vacations and better salaries to lengthen life as compared with the sister callings. Rest is but another term for rejuvenation, and this in turn means vigor, and without vigor you cannot accomplish good results in dentistry and naturally cannot demand a corresponding remuneration. The element of health enters into the equation of salary and fees in a most emphatic manner. The most dreadful calamity that can befall one of our profession is to allow his practice to make a slave of him, to toil and labor without recreation, to so highly esteem the pleasure of operating for his patients as to deny himself the necessary breathing-spells and opportunities for refreshing his nervous system.

A most troublesome point is the method of arriving at the amount of the fee. Many dentists charge by the "clock system," others by the "service rendered system." I am inclined to the belief that the operation when completed should merit such a fee as is in accord with the material used, energy employed, disposition of patient, and general standing of patron, regardless of what the clock was doing in the meantime. The clock system has so many objectionable features that I have long since taken the clock from the eyes of my patient. When you follow the clock you feel so completely at the mercy of your patient that it annoys you to answer the 'phone, distresses you to welcome a newcomer, and grieves you to shake the hand of a friend—every moment of the specified time belongs to your patient, and for the time being you are a slave. When you leave the chair to attend to these essential interruptions you must stop the professional clock, much as a timekeeper at a football game stops his watch to allow for recuperations and injuries. I have discarded the time system; I despise the treadmill; I love to live.

I quite agree with Dr. McKellops, who once said this about fees: "I never allow a patient to snap a watch at me as an inference to hurry and keep down the price. I am not racing with either sun or moon when I am inserting a gold filling."

It is true that your patients will compare notes and get acquainted with your prices, but we must at some time convince the public of the variety of circumstances which control the charges for any given operation. I contend that scarcely any two operations, even in the same mouth, are precisely similar, hence I have fought the idea that Richmond crowns, dentures, fillings, treatments, or even extractions should have a standard price. We do not deal in commodities; we do not aim to typify in our reproductions; we are controlled by living organisms, subject to the great and divine law of molecular change and correspondence; hence our dominion admits of a variety of charges for what appears to be the same operation or construction.

The Chicago Daily News has this splendid article on the matter under consideration: "Municipal dentists are appointed and paid by many of the larger towns and cities of Germany, says the New York Tribune. In Strasburg, for example, 2,666 children were examined last year, 699 teeth were filled and 2,912 extracted. The method of work is simple. The teacher brings his class to the

dentist, who examines each mouth quickly and marks on a card each child has brought whether treatment is necessary. If so, the child must come again on a Saturday. Russia is also joining in this movement and has already fitted up nine such institutions in St. Petersburg. And why not, or rather, why so late in coming, one might ask? If it is true that, generally speaking, good teeth are necessary to good health and long life, and if, also, a large and growing proportion of citizens have not good teeth, then it follows that the fact is one of public concern. Is it not, for instance, of as much importance to the community that workmen should have good masticating and digesting powers as that there should be $20,000,000 city halls, public parks, expositions, etc.? This little or large realization of preventive medicine has so far made its way into our American minds that we have ordered the soldier's teeth to be attended to and his governmental service by so much enhanced; but the soldier is at last paid by the civil worker, and as to his teeth and service we are entirely indifferent."

It is part of a nation's duty to see to it that her citizens are strong, healthy and vigorous. Her defense depends on the physical perfection of her soldiery, and she cannot expect stanch and endurant cadets or volunteers whose physical being has been handicapped by unwholesome and impure substances.

All governments at present are keenly alive to the interests of commercial and material things, hence this craze for oceanic speed and military art. The United States annually spends millions of dollars in the department of agriculture in the hope of arresting the diseases of swine, cattle and sheep. The government provides the scientists with the best lenses to discover and study the bacteria and agents destructive to the animal and vegetable kingdom, but the human family is left to individual enterprise, and disease hovers at every doorstep in the form of consumption, dyspepsia and pyorrhea, creating a death rate of a most alarming figure. The government could well afford to publish fewer books on cattle and swine bugology, and devote a portion of this enormous sum to the redemption of the citizen health.

The general government appropriates funds for medical advancement and research, while the dental is relegated to individual effort and society endowment, and all present know what a hardship this investigation is entailing upon those few of our profes-

sion who painstakingly labor and eagerly forego pleasures and welcome self-sacrifice in the interest of humanity, all without compensation, and in the majority of instances inducing loss of practice and forfeiting their general health.

If we could make the general public know the true status of affairs as pertains to our present meager means for prosecuting investigations into realms of direct concern to human life, if we could so organize our profession as to impress the legislators, or even convince the civic authorities of the propriety of using public funds for public good, we would have accomplished incalculable good and have done more for the advancement of dentistry as founded on true art and real science than can possibly be foretold or estimated.

DISCUSSION.—*Dr. F. H. Codding,* Dowagiac: This paper is difficult to discuss because the essayist has put the matter so strongly and broadly. There is no question in my mind about the question of compensation for dental services, and there can be none in the mind of the faithful and conscientious practitioner. Some patients appreciate our efforts and do their best to compensate us, while a large number are inclined to traffic about a matter of such vital concern. It would be well if we could live without fees, but we can't, and the people whom we serve must compensate us. Not only are we compelled to provide for our present needs, but we should also anticipate the time when we can no longer accomplish so much as in the days of our greatest strength. One great fault with dentists is that they do not collect their fees as promptly as they should. I do not boast when I tell you that I collect 98 per cent of all the bills rendered. Some people think it smart to beat us out of our fees, and the dentists practicing in a community ought to have a blacklist for each other's benefit. In recent years all kinds of charges have materially appreciated except those for professional services. It would be more profitable for us to go fishing than to work for people who will not pay their bills. If we keep abreast of the times it not only costs money but effort, and in these days of required antisepsis we have greater demands made on us than our predecessors and we should have increased compensation. We can't base our fees on the cost of material and living expenses, so the wear and tear of mind and body should be important elements for consideration. There is a certain amount

of charity or benevolent work to be done in every practice, but it should be performed exclusively on that basis. Where patients can pay the fee should correspond with the service, and no fee that has been earned should remain uncollected.

Dr. S. M. Fowler: I am heartily in favor of the essayist's object, also the gentleman who has just discussed the paper. He is surely a good business man to collect so nearly all he earns. In my city, for instance, the gold crown has gradually gone down the fee toboggan slide until it has struck the four-dollar mark, which I am free to confess is all that it is worth in most cases. Now how are you going to educate 98 per cent of these people out of the notion that a four-dollar crown is the proper service for them to have?

Dr. T. G. Rix, Dowagiac: Dr. Codding was in business with me at one time, and I can substantiate his statement that he is a good collector. When we dissolved partnership he turned over to me a lot of accounts and I have them still. In regard to a fixed price for services, I think we have made a mistake. No two operations are so similar as to make it practicable to name the fee in advance of the sitting. Render the service and then exact a fee that compensates. Professional men are as a rule poor business men. I have saved some money from time to time, but invariably someone who thinks he can handle my funds better than I can comes along with a great scheme and my money goes—I know not how nor where. It is only the money which I have invested in professional affairs that I feel I still own.

Dr. E. A. Honey: The number of dentists in this country has practically doubled in the last twenty years, and the majority of them at least are busy and seem to be making a living. This would indicate that the public is appreciating more and more the value of our work. It is also significant that people are demanding those operations which require the highest degree of skill, and we find that every progressive dentist to-day is equiping himself with the facilities for rendering this quality of service. It seems reasonable that the more exacting the work the better the fee should be, and it will be strange, indeed, if we attain a high degree of skill and are not ready to demand a corresponding fee.

Dr. George W. Cook, Chicago: I wish to express my admiration for Dr. Codding as an ideal business dentist. He talks as

though he were one of those fellows you read about, who shoot their patients if they don't pay their bills promptly. I have some that deserve to be shot. I have worked hours on a nervous patient, endeavoring to extract a pulp nodule, and have exhausted my mental as well as physical strength more than a surgeon would on a case of appendicitis, and yet I have not been able to collect a fee that would in any sense compare with the surgeon's. I started in to educate myself for surgery, but concluded there was more opportunity in dentistry for the use of the natural bent in mechanics which I have. The surgeon may be a little more broadly cultured, but he is not so skillful a man as the dentist, and is not called upon to take the initiative so often. The general public and some physicians do not appreciate the high order of skill required in the practice of modern dentistry. We must make our impression on the public by rendering a higher order of service and exacting proportionate fees for it, and at the same time deserving it by increasing our special as well as our general culture.

Dr. A. S. Rowley: Dr. Cigrand's paper is timely. It is a good plan to think well of ourselves, because we are then in a proper frame of mind to make others think well of us. If we can only make people believe that appendicitis has its origin in bad teeth, we shall have little trouble in making a favorable impression on the public. It would be well if we could realize more than we do the important relations existing between the mouth and the other vital organs of the body. We should then have so much respect for the teeth that we would save more than we do now.

Dr. A. C. Runyan, South Haven: Our profession is yet a young one, and the public knows that. It has, however, given us a fair measure of credit, and I have no doubt we shall some of us see the day when dentistry will take its place alongside of other specialties of modern medicine. I see no reason for complaining of the position the public has accorded us. The greatest discrediting our profession has ever received has come from within our own ranks. When we learn to live with our confreres in the professional spirit we will have no cause to enter the complaint that Dr. Fowler makes of the four-dollar crown. When we assume the dignity of a profession and practice it worthily the peo-

ple will be very glad to accord us not only place, but dignified fees for services.

Dr. J. M. Thompson, Detroit: We do too much work for no fees. Dentists as a rule are ridiculously imposed upon in the treatment of teeth. These services are usually prolonged of necessity, and when we charge for the time consumed it makes a large fee for work which does not show to the patient. This is largely due to the fact that people are accustomed to pay small fees for this kind of service. It is high time that our colleges and writers in general should take up this subject and put it on a rational basis. Many young college men do not know what to charge for their work, as the only experience they have had was gained in the college clinic.

Dr. Cigrand, closing discussion: It is estimated that not more than ten per cent of the people have other dental services than the extraction of teeth and such trifling operations. The other 90 per cent can and should be brought under the influence of our ministry. As a business proposition we can get better fees for our services if we ask and earn them. When you make out a bill do it in a professional way, and not itemize as your butcher does. If your patients can trust you with their lives they certainly can trust you not to charge them more than a fair fee. When you itemize an account patients get an idea that you are selling your service at a given rate, or that you are selling the materials used. Another thing, don't charge by the clock. An hour given to a troublesome patient is worth two or three times as much as when given to another who behaves himself and gives you a fair chance to render a proper service. If you charge by the clock the patient will be tempted to call time on you, and when I am serving a patient I don't care to be bothered by a clock. I intend to do my work right or not at all. Patients can have no intelligent idea of what we are doing or how we are doing it, so they must trust us, and we should never abuse their confidence. A good motto is: "Run your practice—don't let it run you." We can learn much by keeping close to the medical practitioners. They belong to an older profession and their methods are very well established, and the nearer we can approach same the more good will come to us.

EMERGENCY APPLIANCE TO HOLD DRESSINGS.

BY S. H. VOYLES, D.D.S., ST. LOUIS.

We are often confronted with conditions requiring a quickly made and cheap appliance for temporary purposes. Having had two dissimilar cases within two weeks where the same appliance solved the problem, I think them worth reporting.

Mr. C. presented with first and second lower left molars missing. He stated that about four years previous during the extraction of the first molar it was fractured, and the dentist was unable to remove one root. He had since suffered from several abscesses which subsided after lancing. Examination showed an apparently normal resorption, but a very small opening on the ridge, through which I could feel the rough end of the root, but could not determine its size. I thought best to enlarge this opening before attempting extraction, so did so with a lance and forced in a plug of cotton saturated in chloro-percha, but was unable to make it stay in place. I then took a piece of Angle's thin band material and fitted a band to the second bicuspid. To the distal side and at right angles to the band I soldered the end of a piece of Angle's G wire, which is a very soft tough wire. Replacing the band on the tooth, I bent the wire until its free end was just over the opening in the gum, and then cemented the band to the tooth. Bending up the wire, I placed the plug in the opening and bent wire down on it tight. The next and following days I bent up the wire, inserted a larger plug, and bent it down again, until the end of the root was entirely exposed. It was then extracted without laceration of the soft tissues.

Three days after the extraction of this root Mrs. A. presented with a decomposed pulp in the right lower third molar. Drilling through the filling and liberating the gases gave relief, but at the next appointment Mrs. A. said that she would prefer to have the tooth extracted, and as it was largely filled and in bad condition I consented. Desiring gas, she was referred to a specialist, who extracted the tooth at 11 a. m. At 3:30 p. m. she telephoned that the socket was bleeding very freely and that she could not stop it, so I told her to come to my office immediately. She arrived at 4 o'clock and I found a profuse arterial hemorrhage from the socket. Removing the clots from her mouth, I inserted a cotton and chloro-percha plug in the socket, but there was no diminution in the blood flow. Further examination showed an incision or laceration on the

lingual side almost to the bottom, through which the blood was escaping. I could stop it only by placing a folded cotton roll on top of the plug and having her hold her jaws tightly together. By continuing this for half an hour I hoped to establish a clot sufficient to stop the flow, but was not successful, and after three hours work I saw nothing to do but bandage the jaws tightly, when it occurred to me to try the band and spur again. Slipping the band between the first and second molars, and bending it around the latter, I measured the length of band as accurately as possible, working in blood. Soldering together, I placed on tooth, and by burnishing and crimping secured a good hold on it. Removing, I soldered a spur as before. I did not attempt to cement the band, but fitted it as tightly as possible, packed a plug into the socket, and added another piece which I forced between the plug and spur, which held everything tight. There was a slight oozing for five or six hours, when bleeding stopped entirely. After thirty-six hours I removed the plug without any recurrence of the hemorrhage. Comparing this small neat appliance, easily made in ten minutes, with the surgeon's bandage and wads of gauze, shows the difference between dental and surgical treatment of this kind of work.

TREATMENT OF SOME PHASES OF ALVEOLAR ABSCESSES.

BY GEO. W. COOK, B.S., D.D.S., CHICAGO. READ BEFORE THE SOUTHWESTERN MICHIGAN DENTAL SOCIETY, AT KALAMAZOO, APRIL 11-12, 1905.

In the treatment of any disease process, and especially any local inflammatory condition, with or without the tendency to pus formation, much depends upon our conceptions with reference to the stage of tissue changes. The kind of tissue that is involved in the process, the amount and quality of the exciting cause, a full recognition of the phenomena of predisposing certain tissue to be acted upon, and the virulent properties of the bacteria that enter such tissue, will greatly influence treatment.

The tissue from an anatomical and histological point of view that is involved in an alveolar abscess, as well as its physiological function, is endowed with certain protective tendencies which give

considerable power of immunity, and at the same time a destructive influence on bacteria themselves. At the present time we are conversant with the fact that the general physiologic condition of an individual may play an important role in bringing about a predisposition to certain local inflammatory processes, as well as to produce changes in the organisms that find a habitat in the oral cavity.

There are many persons who suffer from chronic alveolar abscesses, which in the majority of instances result in a fistulous opening, and the broken-down tissue cells are discharged into the oral cavity and become one of the constituents of the fluid of the mouth, which may contaminate this secretion in such a way as to prevent its physiological action on the food that is being introduced into the stomach and intestines for the purpose of compensating for the waste that goes on in the body. The condition herein mentioned may not bring about an appreciable change in the general constitution for a considerable period, but it is well known that the gastric juice possesses marked antiseptic and germicidal properties, and the bacteria that pass into the stomach by way of the saliva may be so acted upon by the gastric juice that their effects may not be observed until the individual finds himself in a condition susceptible to other and more important diseases. Therefore persons suffering from chronic alveolar abscesses, such as have just been mentioned, are always more or less liable to some constitutional disturbances in which it would be very difficult to trace the initial cause to this almost unrecognized condition of chronic alveolar abscess.

It is therefore the duty of the dentist to constantly bear in mind that upon his efficiency and skill in treating the teeth preparatory to crowning and filling may possibly depend the value of a healthy and useful life to the individuals who are receiving treatment at his hands. A large majority of these chronic alveolar abscesses are the result of improper treatment of the teeth preparatory to crowning and filling.

Chronic inflammatory conditions in the tissue, such as are located in the apical ends of the roots of teeth, are usually brought about by a continuous, mild, irritating action by a form of bacteria which possess but small virulent properties, and are sometimes almost incapable of setting up a process of sufficient activity to establish a fistulous opening, but whose activity results in the

degeneration of the tissue cells around the foci of irritation. In such cases we usually have what is designated the blind chronic alveolar abscess. This mild degenerative condition of the tissue may continue for some time with only a slight soreness of the tooth, but suddenly and at some unexpected time it assumes a process more or less acute in its pathologic changes, with soreness and more or less uncomfortable feeling when the jaws are brought in occlusion with each other. On the other hand, this mild disturbance may continue for a long time, following a certain line in the cancellated tissue of the jaw, until it has formed a considerable cavity either around the apical end of the root, or it may assume a direction in the tissue, following the lymphatic structures, until it has destroyed considerable tissue and has assumed a position where it is impossible for the tissue to resist the breaking down of its parts. The bacteria then take on a more virulent nature and enter into the lymphatic circulation, and are possibly carried to a remote part of the body, there exerting a more destructive and detrimental influence on the tissue of that vicinity.

The treatment of such conditions as above mentioned must always vary in accordance with the extent of the destructive process and with the constitutional conditions of the patient at the time he presents for treatment. One of the very essential things in such cases is to gain access through the root of the tooth and determine so far as possible the extent of the lesion, especially if there be no fistulous opening. When this initial mechanical process has been attained the question that first presents itself is, how and what agents can best be used? One of the conditions that must be avoided as far as possible is the establishment of an acute inflammatory condition, for the simple reason that if there is an extended tissue degeneration in the locality of the abscess there will be more or less pain and a far greater destruction of the tissue than should occur if the usefulness of the tooth is to be taken into consideration. Then it is essential that we avoid the introduction of a strong escharotic agent or those that are volatile in their tendencies. The escharotic agent will cause a destructive change in the tissue that may be still in possession of sufficient physiological function to regenerate itself, provided these irritating agents which are present in the form of bacteria are arrested in their activity for a sufficient time to enable the tissues to reestablish themselves or neutralize

the poisonous agents that are present as the result of the action of bacteria on the tissues. If a volatile agent be introduced, and especially if it is confined by sealing up the cavity in the tooth, as the process of volatilization of the drug goes on it will carry with it many of the inactive bacterial cells into the tissue which has but little power of resistance, and thus establish a more active process in the tissue, and in a great many instances cause an intense reaction of the tissue, which will bring about an acute form of disease which should be avoided so far as possible.

In this connection it may be well to mention that the regenerative processes of the bony structure are never so rapid as where regeneration of tissue takes place in the soft tissues. Bone regeneration is established by a certain morphological rearrangement of the cells, and goes on for a considerable time after an apparently normal physiological condition has been established. During the period between the elimination of the bacterial irritant and the reestablishment of the normal processes the teeth should be allowed to rest. The operations of filling with gold or fitting bands for crowns, etc., should be postponed for at least two or three weeks after a severe acute or even a chronic alveolar abscess has been restored to a normal physiological condition. The parts should be allowed to rest for a sufficient length of time that the tissues may readjust themselves to a normal mechanical resistance to irritating agents that are not infectious in character, and all agents used for the purpose of treating these conditions should possess the quality of slightly stimulating without irritating the tissue cells, and should inhibit the development of the bacteria.

The profession of dentistry is constantly having brought to its notice agents that are supposed to be antiseptic and germicidal, and which are recommended for filling root-canals to remain there as permanent antiseptics. Carbolic acid is one of the agents that the profession has used in cases of chronic abscesses with fistula, and many claim it to be superior to anything they have tried in the treatment of such conditions; possibly there is nothing that comes as near being universally used by the inexperienced in fistulous abscesses, but there are many agents that are superior if we will but study the pathological conditions to be treated. In cases of abscesses where there is only a fistulous tract without much tissue degeneration around the apical end of the root, an agent that I have tried

with considerable satisfaction is guaiacol carbonate, which is a combination of guaiacol and carbolic acid. This agent has antiseptic properties sufficient to destroy the form of bacteria that is usually involved in such processes; it has the beneficial effect on the tissue of being but slightly escharotic, and it is a mild stimulant to the tissue cells. In the treatment of these cases, where a mild disinfectant is required and tissue stimulation is indicated, this agent should have an important place. It is valuable also in the treatment of some forms of antrum trouble.

In the so-called blind abscesses—I mean those where there is no fistulous opening—as I have previously stated, it is important that they be treated in a different manner from those with a fistulous opening. The guaiacol carbonate in such pathological conditions as a blind abscess would, unless carefully handled, prove to be slightly irritating. I have observed that when this agent is confined in a place like the root of a tooth and at body temperature, it becomes sufficiently volatile in some cases to produce the very condition that we wish to avoid, namely, acute inflammatory process. In blind abscesses where there is but little destructive change in the tissue at the apical end of the root, and where slight discoloration of the tooth is of no special importance, there is probably no agent that will give such general satisfaction as a ten or fifteen per cent solution of chinosol. However, as I have elsewhere stated, this agent must be handled with the greatest of care if discoloration of the tooth structure is to be avoided. Chinosol has the distinctive value of being extremely germicidal when brought into contact with such bacteria as are usually involved in chronic alveolar abscesses, especially where there is a slight but continuous degeneration of the tissue and where the bacteria are but slightly pathogenic in their tendency. This agent may also be said to be beneficial in cases of antrum trouble, where there is but little pus formation; for instance, in those cases where there is a mucous degeneration of the tissues following a catarrhal inflammation. Chinosol when introduced into large pus cavities is rapidly neutralized by the pus, consequently its effects are not as beneficial in such cavities as those of the guaiacol carbonate.

Digests.

IMPORTANCE AND METHODS OF AN EARLY DIAGNOSIS IN MALIGNANT TUMORS OF THE MAXILLARY BONES. By A. Hamilton Levings, M.D., Milwaukee. Read before the Fourth International Dental Congress, at St. Louis, 1904. The importance of an early diagnosis in the case of a malignant tumor affecting one of the maxillary bones, its periosteal covering, and the muco-periosteal lining of the antrum, can scarcely be overestimated. Upon an early diagnosis may rest a very conservative and still successful treatment in the case of the mildly malignant growths. In tumors which are decidedly malignant an early diagnosis is absolutely essential in order that the patient's life may be saved by timely operative intervention. It is pretty well established that in some of the giant-cell sarcomata invasion of surrounding structures or metastasis does not occur for a few months, or perhaps not during the first year. On the other hand, in many of the round-cell sarcomata and in some of the endotheliomata and carcinomata regional or distant infection is likely to take place during the first weeks or months of their growth. In these cases if operation be deferred beyond this time it will be too late ordinarily to save the patient's life.

In the majority of the malignant tumors of the maxillary bones the first symptom is a pain in the jaw or in the tooth. Following this there may be swelling, and then ensues loosening of the tooth or teeth. With these symptoms the way is made easy for patient and dentist to consider the trouble as of no great moment, or as one which most concerns the tooth.

The importance of an early diagnosis is so great that in every case of pain in a tooth or in the jaw, especially if later associated with swelling of the gums or expansion of the bone, the physician or dentist should not consider that he has done his whole duty to the patient unless he has exhausted every method at his command which could aid in establishing a correct diagnosis. When one considers the disastrous results of delay in these cases, the responsibility resting upon the physician or dentist is seen to be very great.

Every case of tumor of the maxillary bone should be considered possibly malignant until it has been proved benign. At least half a dozen cases of round-cell sarcomata, taking origin from the maxillary

bones or their coverings, have come under my observation in which treatment has been carried on for five or six months under the mistaken idea that the patient was suffering from necrosis or caries of the jaw, neuralgia, or chronic pyogenic infection. In other cases there has been no especial effort to establish a diagnosis, the cases being treated as of no great importance and expectantly until such time as the diagnosis might become clear. The case is usually then non-operable. In any case of odontalgia, or in any case in which there is a pathological process going on in the maxillary bones, any delay in making a diagnosis or in not using all the means for that purpose at our command is absolutely inexcusable—one might almost say criminal. An early diagnosis may be difficult, but it is possible in nearly every case if one be on the alert.

Clinical Methods of Diagnosis.—In our efforts to reach a diagnosis it is of the first importance that we have a clear understanding of the symptoms and course of the malignant growths implicating the maxillary bones. We should if possible differentiate the malignant neoplasms not only from the benign but also from those pathological processes within the bones, periosteum, and teeth which are produced by infection or chemical action. The malignant tumors which implicate the maxillary bones or their coverings are the sarcomata, the endotheliomata, and the carcinomata. The sarcomatous growths are divided according to the shape of the cell into large and round-cell sarcomata, large and small spindle-cell sarcomata, and giant-cell sarcomata. It is necessary to keep these species distinct in one's mind, because the malignancy of these growths depends largely upon the shape and size of the cells.

As is well known, the sarcomatous growths take origin from the connective tissue, and in these situations they may spring from the periosteum covering the bone, from the alveolo-dental membrane, from the muco-periosteal lining of the antrum of Highmore, and from the osteogenetic layer lining the medullary or Haversian canals. They usually occur before middle life, but a goodly number of cases have been observed even in young children. The patients often give a history of an injury which may have been the exciting cause. These tumors are not encapsulated or circumscribed, and only infrequently infect the adjacent glands. There are two varieties of sarcomatous growths which take origin from the periosteum. One of these is known as an epulis, the other as a periosteal sarcoma.

The epulis is a soft, rather-rapidly growing, well circumscribed, comparatively painless tumor, which bleeds easily, has a reddish color, takes its origin either from the mucous membrane of the gum at the border of the tooth or teeth, from the outer layer of the periosteum covering the bones, or from the alveolo-dental membrane lining an alveolus. The growth is in direct relation with the crown of one or more teeth, along which it is projected toward the free border. It may require several months, perhaps a year, to reach the size of a small almond nut. During this time the teeth may be loosened in their sockets in consequence of the growth implicating the alveolo-dental membrane. It is to be differentiated from the fibroid epulis, which is much harder, grows slower, does not bleed readily, and is covered with a normal mucous membrane. Microscopically, the epulis is often a mixed growth containing giant and spindle cells, the former usually predominating.

The second variety of the sarcomatous growths take their origin from the osteogenetic layer of the periosteum or from the alveolo-dental membrane. They are consequently primarily situated between this membrane and the bone, or within a tooth-socket. Some of these tumors grow very slowly, others grow rapidly. They are oval, elongated, globular, and seemingly well circumscribed or diffused tumors which are immovably connected with the bone. They are very hard and smooth, and usually have a pretty uniform consistence. In some cases, however, they are very irregular upon the surface, and may even contain cysts. If situated upon the inferior maxillary bone they may cover but a limited area or completely surround the bone. In taking origin from the alveolo-dental membrane of the superior maxillary bone they often invade and even fill the antrum or extend over the surface of the bone as an irregular mass. In one of my cases of a round-cell sarcoma, the process having begun in the socket of an ulcerated tooth spread rapidly along the gums to the tonsil and soft palate upon the inside of the jaws, while upon the outside it invaded the cheek and adjacent glands. The case was non-operable six weeks after its inception.

In a case of giant-cell sarcoma having the same origin the process invaded the antrum and gums and spread along the anterior walls of the superior maxilla beneath the periosteum, producing a tumor of considerable size. This extent of growth was effected in about three months. A cure was attained by resection of the superior

maxillary bone of that side. It is characteristic of many of these growths taking origin from a tooth-socket that they spread rapidly along the gums, infiltrating them and causing marked swelling. Some of the periosteal sarcomata are made up of giant cells, others of spindle cells, and others of round cells, or the growths may be mixed in character, containing perhaps round, spindle, and giant cells. A goodly number are osteosarcomata or osteochondrosarcomata, in that they contain both bone and cartilage.

Diagnosis.—The sarcomatous epulis is not likely to be mistaken for any other tumor, unless it be a fibroid growth in the same situation; but the increased vascularity, redness, softness, and accelerated growth of the former make it ordinarily easy of differentiation. A periosteal sarcoma other than an epulis is perhaps not so readily differentiated. When it occurs on the alveolar border of one of the maxillary bones or over the compact substance it produces, as a first symptom, swelling which can readily be made out in consequence of the superficial position of the bone. This swelling is fixed, not well defined, and is slowly or rapidly progressive. The swelling is followed by pain which is seldom severe. Except in the most malignant cases there is no fever, or not more than one-half to one degree, and for weeks no glandular enlargement or special constitutional disturbance. It should be understood that the malignant tumors after their inception have a certain period of growth during which metastasis does not occur. This period may be represented by but a few weeks or by months. It is necessary, if the patient is to receive the greatest benefit from the treatment, that the diagnosis be made during this period—that is, during the first few weeks following the inception of the tumor. These periosteal sarcomata are not likely to be mistaken for fibromata, osteomata, cysts, or other benign neoplasms, in consequence of the very slow, indolent, and painless growths of the latter; but they must be differentiated if possible, and that very early, from other periosteal affections, such as acute and chronic periostitis of pyogenic origin and periostitis of tubercular, syphilitic, and chemical origin.

Pyogenic periostitis, if acute, comes on suddenly and is accompanied by intense pain, high fever, great tenderness, and marked constitutional disturbance. The very mention of the condition would readily lead one to differentiate it from a chronic periosteal process of sarcomatous origin. Chronic pyogenic periostitis will give a his-

tory of some chronic inflammatory process with infection, such as a carious tooth, ulceration about the gums or within the mouth, or a trauma with infection. Less frequently the process will be due to an exanthematous or rheumatoid affection. In these cases there will be localized pain, swelling, and tenderness; swelling never marked, fever slight or absent, the condition not being progressive or leading to the formation of a tumor.

Chronic tubercular periostitis is a rare affection in this situation. There will be a circumscribed, slowly progressive swelling of the periosteum, with pain and localized tenderness. Fluctuation may be present, with tubercular pus formation. In these cases, if the process be situated over the alveolar process, caries of the bone may follow. The affection never occurs in a healthy individual, but usually in one who has given other indications of tuberculosis. In the maxillary bones a syphilitic periostitis, though rare, occurs as a chronic process both in the acquired and inherited forms of syphilis. There may be a more or less circumscribed periostitis with the formation of a syphilitic node, or a syphilitic gumma may occur. There is usually a severe aching pain which is worse at night. The process is a slow chronic one, and the node when formed is oval, smooth, hard, elastic, and situated within the periosteum and upon the bone. Degeneration with softening and discharge of the gumma or node frequently takes place. The underlying bone is often primarily eroded, while the bone adjacent to the gumma becomes hypertrophied. Such a periosteal node of syphilitic origin, over the inferior maxillary bone, in a boy of twelve years recently came under my observation.

There are some cases of chronic periostitis, especially those due to a trauma, in which new bone is formed beneath the periosteum. In these instances the new bone is simply a lamella or splint which is laid down beneath the periosteum. Where the symptoms and clinical course, however, are insufficient for diagnostic purposes, one should use the X ray. In the osteosarcomata, which are frequent in this situation, the picture will show spicules of bone placed perpendicularly to the shaft. This is characteristic, almost pathognomonic, of this growth. Sarcomatous growths situated upon bone practically always produce more or less destruction of the underlying bone, no matter whether this bone be cancellated or compact. If the X ray shows destruction of the superficial portions of the bone

the condition is at least very suspicious and is almost certainly either sarcomatous, tuberculous, or syphilitic. When a study of the symptoms and clinical course and the use of the X ray are insufficient to establish a diagnosis, an exploratory incision should be made. This will show in an osteosarcoma a cellular mass, spicules of bone, and often areas of degeneration or hemorrhage with superficial caries. In a sarcomatous growth which does not contain bone the mass is soft, highly vascular, and cellular, with more or less erosion of the underlying bone. Often there will be perforations of periosteum and a diffused, not well circumscribed infiltration of the overlying tissues.

Medullary Sarcomatous Tumors. These growths are of frequent occurrence. They take origin from the interior of the alveolar process and either from the osteogenetic layer of the medulla or from the tooth-socket. The symptoms will vary, a good deal depending upon the species. The giant-cell sarcoma, one of the most frequent, is a semi-benign tumor. It grows slowly, taking a year or more to reach any considerable size, and during this time may not produce metastasis or affect the health or well-being of the individual. Pain is usually the first symptom indicating its presence. This is not severe, and often is mistaken for an ordinary toothache. The pain is caused by the growth's exerting pressure upon the overlying bone, and it increases, though it seldom becomes excessive. In a short time a slight expansion of the jaw occurs from pressure within, and then swelling is to be noticed. The overlying tooth or teeth soon become loosened, the swelling progresses, the pain increases, and the teeth are often extracted. During this period there will have been little or no fever and but slight functional disturbance.

The round and mixed-cell sarcoma, taking its origin from the interior of the bone, is often an extremely malignant tumor. It grows rapidly, invades and destroys the bone, reaches the periosteum or mucoperiosteum, which it invades, and then infiltrates the overlying soft tissues. In these rapidly growing sarcomatous growths there is often a fever of one, two, or even three degrees, with loss of appetite and flesh. There will be weakness and other marked constitutional disturbances. As the tumor in its growth destroys the bone, the X ray will show a light area corresponding to the growth, while an incision will disclose a non-encapsulated, soft cellular mass. If the X ray does not show destruction of the bone an operation may

be deferred, but if it does an operation is imperative for differential diagnostic purposes. Malignant growths taking origin in this situation must be differentiated from neuralgia and the pain of carious teeth, from necrosis of the jaw, acute and chronic, such as pyogenic osteomyelitis, phosphorous, mercurial, arsenical, and exanthematous necrosis.

Neuralgia is easily differentiated, as the patients usually suffer neuralgic pains in other portions of the body or throughout the area of distribution of some branch of the fifth nerve. There is also absence of swelling, loosening of the teeth, fever, and other pathologic conditions within the jaws. Caries of the enamel leading to exposure and inflammation of the dentin or pulp should not be mistaken for a growth within the bones. From my own experience I have reason, however, to know that these sarcomatous growths are often mistaken for and treated as cases of caries or necrosis of the bone. Acute diffused or circumscribed necrosis of pyogenic origin, with its sudden onset, swelling, intense pain, and fever, is not likely to lead one into error. The only processes likely to mislead, if one be at all cautious, are the cases of chronic necrosis and the benign growths taking origin within the bone.

Phosphor-necrosis, with its gradual onset as a diffused periostitis accompanied by the loosening of many teeth, with profuse suppuration and a history showing exposure to the fumes of phosphorus, will readily lead one to differentiate it from a sarcomatous growth.

Mercurial necrosis, occurring after the administration of large doses of mercury, is preceded by intense ptyalism. It comes on suddenly and is followed by marked swelling of the periosteum and gums and loosening of the teeth.

Arsenical necrosis may occur as the result of the application of arsenious acids within the cavity of a carious tooth, but in these cases the necrosis is very limited and usually confined to the alveolus of the affected tooth. The process is not followed by marked swelling. Cases of exanthematous and typhoid necrosis correspond in a measure with those of acute osteomyelitis, only they are less abrupt in their onset and pursue a more chronic course.

A syphilitic gumma within the medulla, occurring either as the result of acquired or inherited syphilis, may lead to the gradual expansion and absorption of the bone, and will be difficult of differentiation from a sarcomatous growth without a history of syphilis

and without exploratory incision. A tubercular inflammation may occur in the interior of the maxillary bones as the result of the implantation of the bacillus of tuberculosis and the formation of a tubercular node. The inflammation is very slowly progressive, the expansion of the bone gradual and seldom considerable. There is usually a limited area of tenderness in the overlying periosteum, often with fever and usually with a history of tuberculous processes elsewhere in the body. With central destruction of bone, the X ray picture would show a light central area the same as in sarcoma; an incision, however, would establish the diagnosis.

Differentiation From Benign Tumors.—The benign growths which implicate the interior of the maxillary bones are the odontomata, fibromata, osteomata, the cysts, and the benign epithelial growths. The general characteristics of the benign growths are that they usually occur in young persons, and do not for a long time produce pain, expansion of the jaw, or loosening of the teeth. They never produce metastasis nor do they affect, except as the result of pressure or infection, the health or well-being of the individual. They are also comparatively rare, being much less frequent than are the malignant tumors. The odontomata have also the further characteristics that they are usually associated with a non-erupted tooth or teeth and are congenital in origin.

The cysts which occur in the alveolar processes have their origin from the epithelial cells which were projected from the mucous membrane in fetal life into the subjacent tissues for the purpose of producing the enamel of the teeth. These columns of sequestered cells, when they have served their purpose, usually undergo degeneration and absorption, but when the conditions are favorable they may multiply and cause either a cystic or solid tumor, and this may be either benign or malignant. Three cases of solid epithelial tumors, two of them benign and one malignant, have been reported, having their origin from these sequestered cells. One case of cystic tumor having its origin from these cells occurred in my own practice, in a boy of ten. The right side of the lower jaw became very rapidly expanded without pain of any kind or loosening of the teeth. On incision a cyst was found as large as an English walnut. Microscopically the wall was made up of epithelial cells resting upon a fibrous base. The age of patient, rate of growth, want of constitutional effects, X ray pictures, and if necessary an exploratory incision

disclosing a cyst or other well circumscribed growth, will serve to establish the benign character of these tumors.

Endotheliomata also occur in the maxillary bones, more especially in the alveolar processes. They take their origin either from the endothelial cells lining the lymphatic vessels or from the endothelial or perithelial cells of the blood-vessels.

The so-called angeio-sarcoma is nearly always an endothelial growth which has taken origin from the cells of the blood-vessels, the first act in its formation being the sprouting of the endothelial cells of the vessels and the formation of new capillaries. The endotheliomata of bones rich in blood-vessels are at times very malignant; as a rule, however, they have a low grade of malignancy, and except at a late period do not produce metastasis or other marked constitutional disturbances. They cannot clinically be differentiated from the sarcomatous growths.

Carcinomatous Growths of the Maxillary Bones or Their Coverings.—This genus is represented by three species. One of these is the epitheliomatous ulcer which may be seen upon the gums, and which has all of the characteristics of an epithelioma in other situations. Primarily there may be an ulcer, a fissure, or a small wart. Ulceration in any event is soon established. The ulcer if upon the inside of the gums may spread to the tongue, tonsils, and soft palate; if upon the outside of the gums it is likely to spread to the cheek. It is usually circumscribed, often round, and has the hard, indurated, parchment-like base which is so characteristic of these ulcers in other situations. It occurs in persons advanced in years. The ulcer cannot be made to heal by any of the ordinary means, and sooner or later invades the adjacent tissues and produces enlargement of the nearest lymphatic glands. The only condition with which it is likely to be confused is a tubercular ulcer. This, however, has not the board-like induration of its base and borders, is not so progressive, and occurs usually in individuals giving other symptoms of tuberculosis.

The second species of carcinoma is the adenocarcinoma. This occurs in the antrum of Highmore, from the glandular structure of the mucous membrane, and produces a soft, very vascular, at times rapidly growing and very malignant tumor. The growth may in a short time fill the antrum, causing pressure upon and later destroying its walls, after which it invades the surrounding structures, implicating the lymphatic glands adjacent and producing distant

metastasis. With very few exceptions the process occurs after middle life, and more frequently after fifty years of age. The growth is attended with a good deal of pain and swelling. The swelling may be limited to one or implicate all of the walls. The diagnosis is made by taking into consideration the age of patient, the comparative rapidity of growth, the severe pain followed by destruction of the walls of the antrum, with regional and metastatic infection. An X ray picture will disclose destruction of the walls, and an exploratory incision will show a soft cellular growth filling the antrum and invading the adjacent structures.

The third species is the cystic or solid carcinomatous or epitheliomatous growth which occurs within the alveolar processes from the sequestered cells of the enamel organ. Very few of these cases have thus far been reported. These were small fleshy or cystic growths within the bone or pulp-cavity. They do not seem to have been very malignant. Their diagnosis would be difficult without a microscopic examination.—*Cosmos.*

HAVE WE ANY FURTHER USE FOR AMALGAM? By Rodrigues Ottolengui, M.D.S., New York. Read before the Central Dental Association of Northern New Jersey. When amalgam was first introduced the cry was, "Have we any use for amalgam?" and now that porcelain has found a permanent place in our armamentarium we may justly consider the question used as a subject for our discussion to-night. In connection with all other material we have advocates so ardent, that for their special favorite the claim of universal usefulness is made. The truth is that for each filling material there are some locations and conditions which make it most desirable, and, conversely, some places where it would be least useful. It is a significant index of the present temper of the profession that just now our current literature offers papers discussing "The conservative use of porcelain," "The comparative value of gold and porcelain?" "Where gold is preferable to porcelain," and other essays of like trend. Thus we see a stemming of the porcelain tide, which had threatened to flow so high as to obliterate valuable landmarks in conservative practice. I think I therefore need make no apology for introducing a discussion of why, when and where to use amalgam.

Choice of Materials.—Time was when our choice of a permanent

filling rested between gold and amalgam, and the selection then was not so difficult. Some cavities cannot be properly filled with gold; therefore amalgam became the only alternative. But some cavities which cannot be well filled with gold can be successfully treated with porcelain, so we see that porcelain is not merely the alternative of gold, but should occasionally be used in preference to amalgam. If I should specify to make clearer my meaning I would say that we have in the past filled with amalgam teeth the cavities in which could not be kept dry long enough for the proper retention of gold, or cavities so sensitive that the retention needed for amalgam was more easily secured than a preparation required for gold. Such cavities may often be successfully and painlessly prepared for and filled with porcelain. Between three filling materials therefore the choice is much more complex. I shall not undertake an elucidation of the whole subject, but shall confine myself chiefly to an enumeration of the places and conditions which render the proper utilization of amalgam the wisest procedure, regardless of the financial aspect. And let me say here that the true dentist who serves his patient rather than himself will always use the *best* filling material regardless of the profit that the operation may bring to him.

Amalgam in Crown Work.—I have laid down the postulate that there is for each material some place where it is the very best reliance. The first situation under this class in relation to amalgam has to do with the crowning of teeth. Wherever a broken-down root is to be crowned with a shell crown, in these days an operation rightly restricted to molars, it is my view that the natural tooth should first be protected by as perfect an amalgam filling as can be made. There are several reasons for this, and it is especially obligatory when decay or fracture has destroyed a portion of the tooth below the margin of the gum, for then the replacing of the lost part with amalgam renders the fitting of the gold band more easily possible and painless. It also permits the use of a band which does not extend too far below the gum, and assures a tighter adaptation through the restoration of the circumference of the tooth root to its full proportion. But even where the root is sound for some distance above the gum it is advisable to fill the cavity proper with amalgam first and to build up as high as possible while leaving space for well reinforced cusps. Treated in this manner there is less likelihood of subsequent decay under the crown, and it is better sup-

ported with a minimum of cement, since the crushing stress will be better borne by the metal than by a large mass of cement.

Amalgam in Compound Cavities.—Approaching the realm of fillings proper, we find the first demand for amalgam in those situations where the ravages of caries require that the filling shall be carried far beneath the gum. Here, however, while the demand is for amalgam, success cannot be obtained without due observance of an exacting technic. Amalgam is chosen because it can be quickly and accurately packed into such places, but it must be remembered that no filling near the gum or beneath it can be counted reliable which is not absolutely smooth, and it is in this demand for a high polish that we meet an obstacle with amalgam in this situation. It can be easily put into place, but it is also easily displaced, as hardening is the result of a considerable lapse of time, and during this period the filling is exposed to the careless masticatory stress of the patient, which may compress it so that it comes back with a serious overhang at the gingival margin. This is difficult to remove, as amalgam along the gum margin is more resistant to our polishing methods than gold. An accident of this nature is worse than a real fracture, as the latter compels refilling, while the former may be and too frequently is overlooked.

Formation of Matrices.—In rare instances such cavities may be filled without the matrix, but I think it safer and wiser always to use a matrix of some sort; wiser because aside from the safety assured we acquire increased skill in matrix manipulation by constant practice. Occasionally I use a removable matrix, but usually prefer one which tightly surrounds the tooth and which may be made in a moment. For a removable matrix I employ thin sheet steel. This is cut into a half circle and bent so that it binds against the sides of the tooth to be filled and against the adjacent tooth, being thus held firmly during the operation. The part which lies next to the gingiva should be curved so as to pass below the cavity margin, without biting the gum at the lingual and buccal angles. Further security and safety are assured if this part of the matrix is contoured so as to pass under the bulge usually present at the neck. Where the adjacent tooth is too far away to bind the matrix into position it may sometimes be held tightly against the gingival margin with matrix clamps, or by packing the interproximal space with spunk or by tying.

For a continuous tight matrix I use the band material familiar to orthodontists, and solder the ends with soft solder. If for any reason there is difficulty in making such a band for the tooth to be filled, an equally well-fitting band may be made by utilizing the similar tooth on the opposite side of the mouth. Thus a matrix band needed for the first right lower molar may be made around the first left lower molar. This sort of matrix will often reassure the operator against the danger of disturbance during the setting of the material, as it can be left in position for twenty-four hours without discomfort. In such case provision should be made for the proper knuckling of the filling, and to attain this the band should be trimmed very narrow at this side, so that it serves as a matrix along the gingival margin, but does not extend quite up to the point of contact. Here the amalgam may be built over the matrix edge and tightly against the adjacent tooth.

Polishing.—At the next sitting the matrix is readily cut and removed sidewise. It will then be found that the filling along the gingival margin is well adapted without overhang, and may be polished with a narrow strip of sandpaper passed in through the side, no attempt being made to open the contact. The margins are all polished and the filling made as bright as possible without opening the contact. This done, a fine smooth-sided saw is carefully passed through the contact several times, removing the little shoulder which will have been made by the polishing strips and disks, but not cutting down the contact, the teeth yielding enough to allow the passage of the saw. Of course if the teeth could have been separated first it would be permissible to pass very fine strips through the contact point as a final finish, depending upon the return of the teeth to position for the restoration of contact. It is advisable, however, to trim the actual contact as little as possible, always, however, getting it smooth.

Matrix for Buccal Cavities.—There is a use of the band matrix which I have not seen elsewhere recorded. This is in connection with those troublesome cavities in buccal surfaces, of lower molars more especially. It is often impossible to place a clamp in this situation, and in some mouths the napkin dams back the moisture for only a brief time. Where the divergence between the greatest diameter of the tooth and its neck is not too great a band matrix may be made, placed over the tooth and cavity, and then a flat burnisher

used to force the upper edge of the band away from the cavity, this act at the same time forcing the lower edge of the band tightly against the lower margin of the cavity. This forms a pocket into which amalgam may be quickly packed, and the band may then be burnished back tight against the filled cavity, forcing excess of mercury out and tightly compressing the filling. Where the cavity extends below the margin of gum the matrix may be curved so as to extend down and engage the edge, thus greatly facilitating the filling. A matrix so used entirely eliminates the danger of a defective lower margin so commonly caused in the effort to smooth this edge with burnishers, starting a flow of blood which incorporated with the amalgam causes it to crumble.

Adjacent Compound Cavities.—Where we have two large compound approximal cavities adjacent the case is complicated, and it is my advice and practice never to fill both at a single sitting. A simple procedure is sometimes useful. Both cavities being prepared, they are filled as a single cavity with the hardest impression compound obtainable. This is thoroughly chilled and then is carved from the cavity to be filled, care being observed to disclose the margins without removing too much of the compound, and thus is made a perfect cavity in which to pack the amalgam. The second filling, however, should be inserted not later than the following day, as the compound softens under the warmth of the mouth. Another method is to fill one cavity carefully with gutta-percha first, and then apply the band matrix which is left in place till the amalgam hardens, when the second tooth may be filled in a similar fashion. Never insert the amalgam first and then fill the second cavity with gutta-percha, the matrix being off.

I might stop here and say "here ends the use of amalgam." Certainly, according to my view, these large complex cavities are the only places where amalgam is our sole reliance, and even here our use of the material will decrease in proportion as we become skilled in making gold inlays.

Restriction in Use of Amalgam.—In my opinion, in proportion as the patient is young the use of amalgam should be avoided. Beginning with the youngest teeth that we must fill, amalgam in temporary teeth should be restricted to occlusal cavities in the temporary molars which have surrounding walls. Whenever the cavity involves the approximal surface gutta-percha is preferable, as it not only

serves the purpose of saving the teeth, but also aids in the expansion of the jaws for the reception of the second set. When we come to the permanent teeth I like gold, which I think should be inserted as soon as possible after the initiation of decay. If caries has progressed too far, or the teeth are too sensitive, or the little patient be too refractory, or too nervous for extensive operations, pink gutta-percha should be used until conditions make gold possible. Amalgam is less a tooth-saver in young than in adult mouths and should be used as little as possible.

Aside from the large cavities referred to, amalgam may be used in mouths where we find that others have used amalgam before us, and we can note that it is acting as a permanent filling without inviting recurrence of decay. If examination of a mouth where there are many amalgam fillings shows them all in more or less bad order, the dentist should carefully observe whether or not these fillings have ever been properly polished. If so, it is evidence that a painstaking man has done the work, and it is almost time wasted to make further use of the material in such an environment. Even in such cavities as I have outlined it might be wiser to place crowns at once, especially in pulpless teeth, but if the dilapidated condition of the amalgam fillings and the teeth containing them is accompanied by evidence which shows that the fillings never were polished, that gingival margins were left rough, that contact points were left open, the material should not be censured—the fault was with the dentist. Thus the postulate is, avoid amalgam in young mouths, and in adults be somewhat guided by the work that has gone before.

Does Amalgam Inhibit Erosion?—I may here record an experiment made by me some years ago which had an interesting result, though of course not a conclusive one. We must have more evidence along similar lines before believing that amalgam will inhibit erosion. I had in my care two men, one about forty years old and one about sixty, and both suffered from erosion. The younger man likewise had some pyorrhea, which was only kept under subjection by constant care, and in his mouth I found buccal erosion on all eight bicuspids. I filled the four on the left side with gold and those on the right side with amalgam. About five years later the erosion around the gold fillings was so extensive that I removed the gold and inserted amalgam, the fillings of amalgam on the opposite side

having remained with perfect margins, much to my surprise. Five years later all eight amalgam fillings are in good order. It must be remembered, however, that this man has been under constant observation for the cleansing of these teeth during all this period, and that I always repolish those amalgam fillings, thus keeping them bright.

With the older man I used the amalgam and gold somewhat differently. On either side of the mouth I filled one upper and one lower bicuspid with gold and one upper and one lower one with amalgam, and thus I had the fillings in more absolutely similar environment. In this mouth, which has been in my care for some fifteen years, no skill of mine (except crowning) has ever entirely eliminated caries. Do what I might, in time there would be a recurrence of decay somewhere next to or near to the fillings. Here again the amalgam has outlasted the gold, and in this case also the mouth has been under constant observation and the amalgam fillings have been repolished.

Polishing.—It is rare to see amalgam in fine condition after long use, but I do believe we would see more of it if the filling at the outset were given the same high finish as is usually bestowed upon gold, so it may not be amiss to touch upon this phase of the topic. I think amalgam should be scrupulously polished, at a second sitting of course, and to do this I believe it obligatory to place the dam. Amalgam will take a very high polish if care be observed in the work. It is best to use fine polishing strips or disks from the first, as the coarser make scratches the removal of which too much reduces the size of the filling, and the trimming down is quickly done even with fine disks. The filling reduced to the desired shape, which in occlusal surfaces should include restoration of cusps and what may be called masticatory contour, the surface should be made smooth with fine pumice and moose-hide disks, and this should be followed by whiting and a fine brush wheel. This will produce a surface like burnished silver. These fillings of course tarnish and lose their beauty, but at each cleansing the luster is quickly restored with the polishing brush. I wish to lay stress on this point, as a moderately stiff brush will polish an amalgam filling so as to astonish those who have not tried it.

Removal of Amalgam Fillings.—I have spoken of where and how and why to insert amalgam, and would now say just a word as to the

removal of amalgam. It is probable that many follow this method, but I do not recall having seen it in print, and it has been of such service that I cannot refrain from mentioning it. In earlier days nothing harassed me more than the removal of a large amalgam filling, especially in a sore tooth. Then I thought of a method, tried it, and have never once had trouble since. To bur out or drill out an amalgam filling, with constant syringing out of the debris, is a trial to both patient and operator. I use a spear-pointed drill, made sharp for the purpose, and I prefer a drill because it cuts rapidly and does not clog as a bur does. I drill a hole into the filling at the median line, and by moving the drill back and forth as it cuts I make this a slit. This slit is continued until the filling is actually divided into halves. One easily tells by the sense of touch when the drill passes beyond the amalgam and reaches the dentin, when of course drilling in that particular direction is stopped. The filling thus cut in half is easily removed in two pieces, by pressing each piece toward the center, thus dislodging it.

I have, I admit, rather restricted the use of amalgam, and it may be that I have overlooked some situations in which this material will prove the best reliance. If this is brought to my attention during the discussion I will cheerfully admit it.—*Items of Interest.*

TREATMENT OF IRREGULARITIES COMPARED WITH TREATMENT OF MALOCCLUSION OF THE TEETH. By W. O. Talbot, D.D.S., New Orleans. Read before the Mississippi Dental Association, May, 1905. Irregularities of the teeth mean that one or more teeth occupy an abnormal position in the arch. It may be any one of the seven possible malpositions, or several of them combined in rotation, mesial, distal, buccal, or labial, lingual, elongated, or supraocclusion, and infraocclusion. These are positions teeth may occupy in either arch.

Malocclusion is a more comprehensive term. It includes all irregularity of the teeth, and has special reference to the relative positions of the occlusal planes of the teeth in the two arches when the jaws are closed in mastication. Teeth may be in very good alignment in the arches, and yet the lower arch may be mesial or distal to the upper and the entire occlusion be disturbed. The loss of one or two permanent teeth from either arch may prevent its

development or cause a contraction of the arch and leaning of the remaining teeth to such an extent as to disturb the occlusion, impair mastication, and mar the facial lines, without producing any noticeable irregularity. Molars and bicuspids may not fully erupt, or the incisors may elongate until they impinge on the gums, to the great discomfort of the patient, with the accompanying displacement of the lips, and yet no irregularity of the teeth would be noticed. Any first-course student in dentistry can arrange a set of artificial teeth in a regular curve of the arch, but few dentists can arrange a set of teeth in perfect occlusion on an anatomical articulator. Such a treatment may sound strange, but I judge from the cases I have seen.

Parents bring their children for treatment of malposed teeth when they are overcrowded in the arches, when there is too great space between the upper incisors, or when the irregularity amounts to a marked facial deformity, and request that the teeth be straightened. Not infrequently they insist that they want only the prominence of an upper cuspid relieved, or the upper teeth straightened because they protrude, and direct that a bicuspid be extracted to shorten and simplify the treatment. They claim the lower teeth need no attention, as they are straight enough. People know as much about irregularities of the teeth as their dentists have taught them, and but little more. If we should judge from the average expressions on the subject, the sum of the teaching has been, "Extract to make room." The interdependence of the shape of the arches upon each other, and the importance of retaining all the teeth, to secure perfect occlusion, has not reached the public mind, and it will not except through the dental profession.

In determining the line of treatment to be pursued it is necessary that a correct diagnosis of the case be made. One must consider the relative position of the arches and the jaws, whether mesial or distal to normal, the relation of each malposed tooth to its normal cusp locking, whether or not the harmony of the facial lines is disturbed by the malocclusion, age, and temperament of the patient, and whether permanent teeth have been lost. Upon this last question may hinge the treatment, for when all the teeth are present and the arches in normal relation mesiodistally, the teeth can be aligned in the arches in the normal line of occlusion, the cusps fitted in their places, normal occlusion established, and so the

malocclusion will be corrected. In some cases where a few teeth have been lost for years the space may be regained, artificial teeth inserted and the *malocclusion* corrected. In such cases if teeth be extracted to make room for aligning the remaining teeth, or to harmonize the size of the two arches and the teeth be placed in the best possible relation, the occlusion will only be *improved* and not made perfect, though the *irregularity* will have been corrected.

When the lower arch of teeth is bilaterally distal to the upper, whether it be in the mouth-breather with narrowed arches, protruding upper incisors, and short upper lip, or in normal breathers with upper anterior teeth bunched and overlapped, the teeth can be correctly aligned in the arches, the bite jumped by bringing the lower jaw forward, and the teeth made to close in their normal relations; or the Case intermaxillary anchorage may be used, forcing the upper teeth back and bringing the lower teeth forward until they come in correct relation, and so the *malocclusion* will be corrected. If the distal occlusion be only unilateral in young patients the bite can be shifted on that side and the *malocclusion* corrected.

Should the age of the patient, or previous loss of teeth, render such treatment inadvisable, then extraction in the upper arch may be resorted to in order to make room to *improve* the arrangement of the upper anterior teeth and their occlusion with the lower, and so correct the *irregularity,* but not the *malocclusion.* However, such treatment would as a rule seriously mar the facial lines.

When the lower arch of teeth is mesial to the upper, and the patient young the lower arch may be retracted or the upper also moved slightly forward, as the case may require or permit, and the teeth of one arch brought into correct relation with those of the other, and the *malocclusion* corrected. Should extraction in such cases become necessary the occlusion can only be improved and the *irregularity* corrected.

Therefore, claims to a distinction between treatment of *irregularities* and *malocclusion* are based upon the facts that malocclusion is a more comprehensive term and in its treatment requires more skill, time, patience, and a thorough knowledge of the parts and principles involved, and has for its object perfect occlusion and alignment, and therefore better service of the teeth in their primary function of mastication, and requires that all the teeth shall be retained or lost ones supplied; that so corrected the teeth

are less liable to decay and disease, and the facial lines are restored to a beauty beyond approach when teeth are sacrificed and the arches left too small; while the simple correction of irregularity requires less skill, time, patience, and knowledge, and also less teeth, for it allows extractions, and hence aims only at *improved* occlusion and alignment, and usually results in marring the facial lines.—*Headlight.*

DENTITION—IS IT AN ETIOLOGICAL FACTOR? By Wm. J. Manning, M.D., D.D.S., Washington, D. C. The place of dentition as an etiological factor in the diseases of infancy is one which has given rise to much discussion in both professions. From a very early period the view has come down to us that many of the diseases and conditions seen in children at that age (between the ages of six months to two years and over) were to be traced to "teething." The list is indeed a long one, but as time goes on one disease after the other is withdrawn from the category, until at the present time among the laity only, with a limited number of physicians, are obscure symptoms laid at the door of dentition.

Some physiologists claim that the growth and eruption of teeth cause no more pathological conditions than the growth of the fingernails or the hair; *secundum naturam* seems to be their motto. Why, they ask, should nature cause this train of pathological sequelæ?—you do not find them following the growth of the various other organs after birth. The mistake is made, they claim, that physicians overlook the fact of disease of the kidneys, brain, intestines, or stomach because it happens to be about the period of the eruption of teeth. They quiet the mother and themselves by the remark that the child is "only teething."

Be all this as it may, no one can deny the fact, if he has made observations, that reflex symptoms of most alarming nature are produced during dentition. While probably one-half of all children cut their teeth without any objective symptoms whatever, the remaining half show symptoms that cannot be denied. There will be disturbed sleep, the child is fretful, and the appetite is impaired. In the majority of cases there is increased salivation, with sharp cries, and the child shows a disposition to stuff the fingers into the mouth. There may be constipation, but as a rule there is diarrhea. The thermom-

eter will show in some cases a temperature of 103° F. or even higher, and it may remain stationary or drop a degree or two. This may continue for weeks.

In rhachitic children all these symptoms may be intensified. When convulsions occur they may be traced to forced or overfeeding, and hardly ever are they due to dentition *per se*. With some of these cases a rash may accompany the period of dentition with each group of teeth.

The child should be watched carefully and examinations made frequently to be sure that some other grave condition does not exist. In the great majority of cases in which the symptoms just described are noticed they are due to some other factor than dentition. When, however, these symptoms all subside on the emergence of the tooth or teeth, and when they are repeated in the same child as each group of teeth becomes involved—together, in each case, with indurated, swollen gums—we may conclude that dentition has been a factor in some degree.

Too much, however, cannot be said against the widespread belief among the laity that diarrhea accompanying dentition is normal or beneficial, and "will do the child good." It is to be noticed that diarrhea does not accompany dentition in cold weather, and this seems to be the best argument against its importance as an etiological factor. It is to be remembered that infants at this age are peculiarly susceptible to any derangement of the digestive tract, and severe cases of diarrhea can be brought on by overfeeding. Especially is this so in the case of bottle-fed infants, where overfeeding is the rule. As attacks of bronchitis and nasal catarrh are readily induced at or about the period of dentition, exposure should be guarded against. Otitis media may exist in a great number of these cases when it is least expected. Acute otitis is secondary as a rule to catarrhal or infectious lesions in the rhino-pharynx, and with exposure otitis may complicate the conditions and the intense suffering therefrom be credited to dentition.

The nervous symptoms may be relieved by small doses of phenacetin and the bromids better than by any form of opium. Drugs as a rule enter but little into the treatment of this condition. All the thousand-and-one devices for making dentition easy are a delusion. Probably the hot pack to induce sleep, together with a small piece of ice wrapped in the end of a napkin, which is given the child to

suck, and the application of iodin tincture to the gums, form the most practical methods of treatment for this condition. Lancing the gums is in a great many cases little more than scarification, and brings relief the same as any local blood-letting will do in the various degrees of acute and chronic inflammation. To be of service to the erupting tooth or teeth the incision should be deep and made through that part of the tissue where the greatest tension is observed. The point of the bistoury should be reintroduced and semicircular sweeps made to free the presenting part of tooth from the integument. It will be found best to have a nurse, if one be present, hold the child rather than the mother, for obvious reasons. Care must of course be exercised as to this procedure being the means of conveying infection.

The formation of mental conceptions at the age of dentition being *nil,* one must almost believe that the suffering is not so intense as the grown person would imagine. Judgment and inference are the most complex products of the intellect. Since conception, perception, memory, ideation, and the association of ideas are the necessary preconditions of judgment and reasoning, they will be more or less affected by every imperfection of these processes. In other words, does the child at that age suffer pain without knowing what pain is? I have noticed that in operations on the very young for harelip, in which no anesthetic was given, the child's cry has been one of annoyance rather than of pain.—*Cosmos.*

GOLD PLATES HAVING TEETH ATTACHED WITH VULCANITE. By F. J. M'Laren, New York. Read before the New York Institute of Stomatology, February 7, 1905. One of the most useful dentures at our command is the gold plate having the teeth attached with vulcanite, but with all its advantages there is one great drawback, namely, the necessity under ordinary circumstances of removing the rubber attachment if for any reason we are obliged to solder with gold, as when there is a fracture of the gold, or in partial cases if the addition of an isolated tooth or an extra clasp is required. This not only involves a great amount of labor, but is always a source of dissatisfaction to the patient, because in spite of every precaution it is impossible to replace the teeth precisely as they were and to which the patient was accustomed.

In consequence I have found it necessary to devise certain methods of overcoming the difficulty, and believing that these are not ordinarily practised, I will endeavor to explain them, as I have used them successfully for several years. For instance, a case which frequently presents is one where an incisor has to be replaced, the plate having the bicuspids and molars attached with vulcanite. The usual impression is taken with the plate in the mouth, and after pouring the model the selected tooth is backed and placed in position; a tail-piece is now fitted from the tooth, reaching to and overlapping the plate. The tooth and tail-piece, being properly adjusted, are removed from the plate, invested and soldered together, and the tooth with the tail-piece soldered to it is now placed on the model and attached to the plate with hard wax. An investment is now made with which it is possible to have one portion of the plate cold, thereby protecting the rubber, and another part red hot to facilitate soldering. The investment is made in the following manner; first adapt pieces of iron to that portion of the plate under the rubber attachment; then use one or two large iron bars about the size of the ridge and extending about two inches back of the plate. If the bars do not come in sufficient contact with the plate, fill in the space between the gold and bars with small nails, binding them all together with fine iron wire. Invest in plaster and asbestos, mainly the latter. Make the investment in three sections separated from one another, one on either side protected by the metal, the third isolated from the plate but connected with the other two by means of small bent wires, leaving bare the portion to be soldered. Place the case on a retort frame, exposing the isolated tooth to the heat of a Bunsen burner, being careful not to permit the heat to touch the part protecting the rubber. While the tooth is being heated use a bulb syringe to drop a little cold water on the side investments. This will allow the front tooth to become red for soldering, while the main plate will be perfectly cold. When the tooth becomes red transfer the investment to a soldering pan and have an assistant apply water constantly to the side investments and iron bars while the heat from the blow-pipe is concentrated on the point to be soldered. Apply the heat rapidly, and do not for a moment allow the plate to become cold until soldering is completed.

When a plate has been split, reinforce with a thin piece of gold held in place by means of small clamps made of thin iron wire or

other material, and place 18-carat filings between the piece of gold and the main plate.

For applying a clasp close to the vulcanite, it may be necessary to cut away part of the rubber in order to get a sufficient thickness of non-conducting material, usually asbestos cloth, and where the clasp is very close to the rubber there may be danger of scorching, but the trouble of replacing a small surface of vulcanite is slight as compared with taking off the teeth and disturbing the articulation. Too much stress cannot be placed upon the advisability of using a concentrated flame, and while as a rule I use the ordinary foot-power blow-pipe, in many instances it will be found necessary to attach a cylinder of nitrous oxid gas to the air-tube of the blow-pipe. This gives an intense concentrated heat to the point of soldering.—*International.*

SPECIFIC INFLUENCE OF ADENOIDS ON THE OCCLUSION OF THE TEETH AND ON THE FACIAL LINES. By Frederick S. McKay, D.D.S., St. Louis. While in a general way the influence of these growths seems to be taken into account when certain forms of malocclusion and facial inharmonies are presented, it is a matter of serious doubt whether the specificity is recognized. In addition to discussing what adenoids are and why they enlarge I wish to consider some of the changes which take place because of their influence, which are always associated with adenoids, and which would not occur were these growths not present.

By adenoids we understand an overgrowth or enlargement of a mass of lymphatic or tonsillar tissue situated in the posterior wall of the nasopharynx. These lymphoid elements are bound together by a delicate connective-tissue reticulum, and constitute a physiological structure normally present in childhood and interesting to us only when enlarged. Thus in no way is it considered a neoplasm or new growth, and it ordinarily disappears by atrophy about the fifteenth year, even in the normal or unenlarged condition.

It is only since 1868 that these growths have been described, and the first one to see them, or at least to write of them, was Meyer of Copenhagen. Probably the first one to connect adenoids with displacement of the teeth—to any marked degree, at least—was David, who in 1883, we are told by Mackenzie, "went so far as to assert that

these formations reveal themselves externally by a modification of the physiognomy, which consists essentially in a deformity of the upper jaw, with projection of the incisor teeth and narrowing of the palatine arch. He holds that the patient being able to breathe only through the mouth in such cases, the palate (still in course of development and comparatively soft) is subjected to constant pressure on its buccal surface and thereby pushed unduly upward. This, however," McKenzie continues, "is evidently an erroneous explanation of an irregular mode of development well known to dentists." Later research, as we know, has shown that David was not so far wrong as he was thought to be.

In considering the etiology or why this tissue enlarges, the old subject of inheritance is once more to the front, and I believe that present-day observers have laid aside the idea that such a thing as the direct continuance of this condition from parent to child is probable. If, however, we broaden the science of embryology to include not only prenatal changes, but also processes commencing at that time and continuing even to adult life, then the theory of inheritance has a wider bearing on our subject, and we might properly class as congenital certain deformities which had their origin in nasal disease which was itself congenital in origin.

Pathology teaches, in reference to a transmitted tendency, that a constitutional dyscrasia like syphilis or tuberculosis predisposes to general glandular enlargement, which tendency is increased because of a "lessened physiological resistance and a diminished vascular tone," bringing about a sluggish circulation. Nowhere is this more true than in the mucous membrane. In my search through the literature for information bearing on this point, the nearest mention of a direct inheritance is in Kyle's book, where it is stated that the transmission of a family type of nose, as, for instance, that nose with narrow, slit-like openings, renders its possessor more prone to an enlargement of the adenoid mass.

The climate of England, which is damp and subject to sudden temperature changes, has been thought to be especially favorable to adenoid enlargement, because of its extreme prevalence there; but I have observed that the high, dry altitude, because of the amount of dust in the air at times, is very productive of these growths, and while there is a percentage against the damp climate, and against

the city child as compared with the child raised in the country, because of the polluted air of the former locality, together with the restrictions that the city life imposes, we realize that it is an affliction of all localities and climates among people advanced in civilization.

In their relation with the adjacent mucous membrane of the nose adenoids may be viewed in two ways. Considering, first, that any purulent condition or infectious inflammation may be existent in the nose, this passage of infectious material over the adenoid tissue may result in its direct infection; and, second, acknowledging that adenoids may exist prior to any inflammatory condition in other parts of the nose, this obstruction may tend to retention of the secretions, lowering of resistance, and hence greater likelihood of infection and further enlargement. That the causes may spring also from a deep-seated origin is patent from the fact that the irritating waste products arising from imperfect renal function in the uric acid diathesis deposited by the circulation may cause this enlargement (Kyle). To go further, when the histological analogy between this tissue and cavernous or erectile tissue is seen, it becomes evident that a marked increase in the circulation as a reflex phenomenon, due to a disturbance at some remote point, will produce enlargement of the tonsil. There seems to be a question among rhinologists as to whether such an enlargement is due to an actual cell proliferation or to an enlargement either within or without the vessels, but I think the evidence is largely toward the latter theory.

In such a way as this, then, by intestinal disturbances, such as constipation and irritation by worms, there will result an influx of blood to the tonsil and a watery infiltration of its tissues, and if for any cause there exists a cyanosis of such organs as the kidney, liver, or lungs, what I might term a cyanotic metastasis may obtain in the tissue we are discussing. So, then, the causes seem to be varied, and since the treatment is out of our province our interest lies chiefly in the results.

Rhinologists have written a fairly accurate description of the effects on the nose in directing our attention to "the respiratory act through the nose and the action of the muscles in controlling the size of the nasal cavity," and how the "adenoid obstruction, if allowed to remain until the bony framework has become firmly united,

permanently fixes the capacity for nasal breathing, with the possibility that this fixation of the bones of the face may leave the individual a confirmed mouth-breather, even after surgical removal of the growths." They have told us of the ill-formed superior maxillary arch and its dependence upon the muscular contraction of the nasal orifices necessitated by forced nasal inspiration and snuffing; of the tilting outward of the anterior portion of alveolar process with the teeth; of the fact that "without adenoid interference the pressure of air within the natural passage counterbalances that upon the external surface and normal development takes place."

It is also supposed that the heightening of the dome of the palate in these cases causes a crimping or deflection of the nasal septum, or, taking the opposite view, that the deflection of the septum causes the vault to rise; but Dr. Watson's measurements of models would seem to indicate that the elevation of the vault is only apparent and is practically the same after treatment as before, whereas it seems to have been lowered. If this is true we are forced to the conclusion that the alveolar process alone is the structure affected, and that the tension of the buccinator muscle with the mouth open is largely responsible for the approximation of the two halves of the arch. As well as being a dependence, that there is an interdependence seems to be borne out by G. V. I. Brown's assertion that "without a full dental arch there can seldom be a perfect nose."

In order that this effort may be considered even as fairly exhaustive, reference must be made to the probability that "the normal development of the bones is modified by the modification of the circulation due to the congested membrane covering them," as is the case in nasal disease. Another idea, and a very valuable one, given to us by German writers, is that normally the tongue occupies the space at the roof of the mouth, except a small area which contains air at a rarefied pressure. In this way external air-pressure holds the lower jaw up and the presence of the tongue keeps the upper arch at its normal width. With the mouth open these influences are of course entirely lost.

But however much the rhinologist may tell us about the high-arched palate, the broadened base of the nose, the separated eyes, the drooping and receding chin, the dull and impaired mentality, betrayed by the vacant and listless expression, the dead voice, caused

by the loss of the nose as a resonating chamber, the protruding upper lip—all of which are shown in a typical face of that sort—the fact that certain peculiar and specific changes take place in the occlusion of the teeth receives too scant attention.

Clinical observation seems to show that as a rule if a child is going to have adenoids at all it will be between the years of five and eight, and that is the age when they can do the most harm in disturbing the occlusion of the teeth. Under normal conditions the first permanent molars in their approach to each other will lock normally, but if the mouth is open at this time almost invariably they will lock in distal occlusion. This point is amply borne out by clinical evidence, and is the vital thing concerned in the retrusion of the lower jaw. Following the natural tendency of teeth to move forward, the upper incisors are free to drift in that direction, and thus a space is created between the upper and lower front teeth, into which the lower lip easily and naturally falls, and the bad habit of lip-biting—or rather the nervous caressing, I might term it, of the lower lip by the upper incisors—further intensifies their forward movement and assists in flattening backward the front of the lower arch, the incisors elongating and finding antagonism in the rugæ of the palate. A dry mouth due to the constant passage of air makes necessary a frequent moistening and swallowing, both of which acts cause muscular contraction of the lower lip in its confines, and give an added impetus to the upper front teeth to move forward.

The shape of the arch in a typical case clearly shows the effect the buccinator muscle has in approximating the lateral halves through its tense condition with the mouth open, the sides of a circle being pressed in the front must move forward, and especially when there is no restraint there. With a normally developed lip, normally functionating, the pressure from it would be received upon the labial surfaces of the incisors, the result being a bunched condition of these teeth with intrusion instead of protrusion, as is now the case (Angle). In no way is this absence of lip pressure so distinctly emphasized as in the difference between division one and division two of class two (Angle's classification), the occlusion of the molars being the same in both divisions.

I am almost ready to lay down as a law this observation—that if during the time of eruption of the first permanent molars the child be a mouth-breather, realizing, of course, the dependence of this

upon adenoids, these teeth will erupt in a distal relation (the lower to the upper), or if not actually locking in this distal contact they will drift into it. Supposing, however, that there is nothing to interfere with normal breathing until after such a time as the first molars become normally locked, and then from some cause the pharyngeal tonsil becomes enlarged, causing mouth-breathing, I think there are cases where the molars will unlock (those, for example, where the cusps are short) and pass into distal relation, but that there are cases where the molars hold, and yet the same disturbances occur in the front of the mouth that we see in the typical cases is amply evidenced.

A little patient, aged about thirteen or fourteen, was examined with me by J. A. Patterson, M. D., of Colorado Springs, who reported that although there were at the time adenoids present, yet the passage of air through the nose was free and breathing could be carried on easily, at least during waking hours. With all the contraction of the arch and its apparent elevation the septum of the nose was straight, a condition which under such circumstances we are led to believe is very unusual, and yet a terrible deformity exists in the arrangement of the teeth, but the molar occlusion on either side is normal.

How are we to account for the normal position of the molars in such cases except on the ground that these teeth became normally locked before there was any nasal impediment, and firmly and staunchly held their ground through the pathological storm which followed, the effects of which we see in the front of the mouth? One is reminded of some terrible shipwreck, in which the good ship goes to pieces, leaving only the stoutest spars standing in grim defiance.

Finding, then, that adenoids are almost invariably present at one time or another when deformities such as we have seen exist, are we not justified in considering their specific influence to be just what we have seen in typical cases? If this be true, there seems to be a period in which these growths, like a thief in the night, stealthily make their appearance, perform their baneful mission, and as silently disappear, leaving like a plague their ravages behind them. Considering these facts, then, I make an urgent appeal to dentists to be aware of this dangerous period, and to recognize at the outset these dangerous symptoms, knowing full well what the result will

be if they are allowed to progress and develop, to the end that our efforts may not only be corrective, but what is far better and higher, that they may be made preventive.—*Brief.*

RELATION OF THOROUGH MOUTH TREATMENT OF FOOD TO THE AFFECTIONS OF THE TEETH. By Dr. Horace L. Howe, Boston. Read before the Harvard Odontological Society, April 20, 1905. That the teeth and adjoining tissues are influenced by the general health is a fact long known to science. Every truth has its corollary. Thus the general health of the individual is to a certain extent influenced by the teeth, in that they are essential for the proper mouth treatment of food, which goes to build up tissue upon which every faculty of mind and body is dependent.

We cannot ignore the function of any part of the body or any faculty of the mind without impairing to a degree the total capacity of body or mind, as every part is dependent to some extent upon other parts, and has its relation to the whole.

If we attend to the voluntary part of nutrition, at the stage of digestion before the food goes to the stomach, nature will perform the involuntary part to perfection.

It is not my object to-night to give an extended account of the affections of the teeth, but simply to agitate the subject of nutrition as related to the teeth. To do this best I will refer to a book written by Mr. Horace Fletcher, and called "The A, B, and Z of Our Own Nutrition." Mr. Fletcher is startling the medical world with his discoveries regarding right living, and is devoting his life and means to telling the world of his deductions. That he has searched out the cause of diseases arising from perverted nutrition is acknowledged and accepted by the most eminent physiologists in this country and in Europe. Mr. Fletcher's discovery is as simple as many great discoveries are, and is this: That we should chew our food until it becomes practically liquefied and of alkaline reaction by means of our saliva. In criticism some say that he places too much importance upon the function of mastication, and that some people are troubled with hypochlorhydria or too little hydrochloric acid in the stomach.

For a moment let us consider the process of nutrition. All our food is acid in a varying degree; our saliva neutral, but alkaline

when we masticate; our gastric juice acid, and so on, alternating with the other digestive fluids. We understand by Anstie's well-known law—*i.e.*, "glands exciting alkaline fluids are stimulated by the presence of acids," and the reverse, "glands exciting acid fluids are stimulated by the presence of alkalines"—that the natural stimulus for the gastric glands would be alkalines; that is, the food, after it has been made alkaline by the saliva. If we swallow our food without sufficient chewing the gastric glands are thus deprived of their natural stimulus, which perhaps may account for the state of hypochlorhydria.

Is it surprising that our stomachs become sour, as the expression is, and rebel, and assimilation and metabolism are affected, when we swallow our food (artificially acid, possibly) without proper mastication? The expression of this rebellion may be slight and soon overcome, but if the abuse goes on disease is sure to follow. In my own case severe headaches were the forms in which nature showed the result of my neglect. These have been completely eradicated by strict attention to the mouth-treatmnt of my food.

Let us trace the process of digestion from infancy. Naturally the child is nourished by the human milk, which is normally alkaline in reaction. This is taken directly into the stomach, and thus the gastric glands have their natural stimulus—alkaline milk. As the temporary teeth erupt the salivary glands develop, and as the child is given food, the least acid foods first (cow's milk, eggs, crackers, etc.), the glands become equal to the task of converting them into an alkaline solution. If the task be too great then trouble begins.

We have all noticed that those who are troubled by pyorrhea alveolaris have the so-called "general uric acid diathesis," and are also troubled with pains in the joints of the extremities, or gout, rheumatism, constipation, etc. Dr. Michaels of Paris, in his very scientific treatise upon saliva, says, "The reaction of the blood to the ordinary agents (litmus, for example) is normally alkaline, but if we study the distribution of acids and bases of the blood plasma we see that the reaction is really acid (Gautrelet, Drouin, Hugorenq), and this acidity is increased and the blood may become decidedly acid by the accumulations of acid waste products which are not eliminated, the secretions and excretions becoming then acid reaction." This would lead us to believe that the serumal

deposits upon the teeth in cases of alveolar pyorrhea are salts or urates from the blood, produced by the overacid condition of the system. The attachments of the teeth to the alveoli are now recognized as true joints. Why is it not reasonable to suppose that deposits might be formed in these joints from the same cause as in the joints of the extremities?

Furthermore, it has been my observation that children who are troubled with sour stomachs and bilious attacks are apt to have the rapid, soft, white caries so destructive to teeth.

Are not these diseases of the teeth, both caries and pyorrhea alveolaris, brought on by the absence of the normal amount of alkaline saliva locally in the mouth and systemically by the absence of nature's neutralizing fluid in the stomach? Tests that I have made seem to bear out this theory.

Since becoming especially interested in this subject I have tested my own saliva and that of many patients for acidity. There are many factors that vary the reaction, as we can see by Dr. Michaels' observations. It seems to be normally neutral, but becomes alkaline with the muscular movements of chewing, whether food be present or whether we chew but rubber. It is less alkaline in the morning after sleeping; the muscles of the tongue and jaws being then at rest. It has been observed that it becomes acid after extreme bodily fatigue, and when I do not feel well my saliva is decidedly acid.

We all know of Gladstone's health, and of his invariable rule of chewing thirty-two times before swallowing his food. The remedy for these difficulties that I have pointed out seems to be had in chewing thoroughly the food that we take, thus using Nature's method of neutralizing the system, However, "reason has but little show against intrenched habit," hence it requires some strength of mind to overcome habit in order to give our food thorough mouth treatment.

It is true that people live, and perhaps in good health, without paying particular attention to the voluntary part of digestion, but if such be the case the balance is maintained by getting rid of the excess of acids by perspiration, or by living upon the least acid foods, as eggs, milk, etc. For instance, the Japanese, who live chiefly upon a diet of fish, rice and other vegetables, are particularly healthy and energetic. Those who have become vegetarians in

this country notice a great improvement in general health and also in the condition of the teeth and gums.

The influence of natural living upon the development and condition of the teeth is nicely shown by Dr. Campbell of London. He divides the evolutionary career of man into five stages: 1. The anthropoid stage; with raw vegetable and animal food. Carious teeth were then unknown. 2. The pre-cooking stage, or the period before the human race used fire for cooking. No caries of the teeth present. 3. The pre-agricultural period, to which the aboriginal Australians and Bushmen still belong and are available for study, with dental caries rare and chiefly met in the third molars. 4. The early agricultural age, with dental caries more frequent. 5. The late agricultural period, or the time in which we live.

The chief characteristic of the food of to-day is its extreme softness, due to agriculture and cooking, and it therefore requires little mastication. Because of the physiological law, "that the use of a part tends to stimulate its growth and development, and disuse to lack of development and atrophy," the teeth and jaws are less developed and more diseased to-day than in the previous ages. In this same way Dr. Campbell very aptly places the cause of adenoids and resulting evils, among them irregular teeth, to insufficient stimulation of the blood in the jaws from lack of exercise of the muscles of mastication.

In studying the skulls of the early Indians, Hawaiians, and Peruvians at the Peabody Museum, I have noticed the comparative absence of caries and irregularities about the teeth. The greater number have good, sound teeth, much worn, but no *distal occlusion* which accompanies adenoids and undeveloped jaws.

The Ancients used to blame their stomachs for all their ills. Possibly the blame was justly placed, and the word hypochondriac (stomach region) and its modifications may rightly express the truth.

The real influence that lack of thorough mouth-treatment of food and perverted nutrition have upon all diseases, both mental and physical, is fast being made clear by the great scientists of the medical profession. For instance, Dr. Haig, the well-known expert on diet, points out that "laziness, stupidity, alcoholism, and other effects that are much against the poor are largely due to excessive

meat-eating, and estimates that in seventy-five per cent of the cases of insanity, cancer, debility, and degeneration generally, improper food and habits of eating are to blame for the patients' condition."

Medical history reveals the fact that the greatest physicians have used medicines only to soothe or alleviate suffering. They tried to impress their patients with the importance of proper feeding, exercising, fresh air, etc., whereas the small ones of the profession have used medicine with the idea of curing, and have neglected and overlooked the natural means. As every faculty of the mind and body grows strong only through exercise, so do the teeth grow strong only by exercise. If we can impress our patients with the importance of the thorough mouth-treatment of food as related to general health, and likewise to the health of the teeth, we can perform for them no greater service.

No one has better opportunity for studying the cause and effect of the abnormal conditions of the saliva than we, whose daily work consists so largely in restoring to usefulness the delicate and highly sensitive dental organs, that are constantly bathed in this very interesting fluid.—*International.*

SINUSITIS AND ITS TREATMENT. By W. F. A. Schultz, LL.B., M. D., D. M. D. Read before the Alumni Society of the Dental Department of Washington University. Sinusitis, or inflammation of the membrane lining antrum of Highmore, may be conveniently divided, for the sake of description in respect to the obvious pathologic character, into simple or acute, chronic and suppurative inflammations; while the latter form is to embrace caries of the bony wall also.

The mucous membrane in the acute stage has been found to undergo considerable alteration on its physical texture. From the usual slight alteration from the normal, attendant upon a mild inflammatory reaction, the membrane may be seen to transpose into a state of remarkable variation. In the acute or simple stage Hacke has observed that it sometimes appears swollen or brown, or soft and gelatinous throughout; he further observed the presence of cysts in three cases, while in one case the membrane revealed the presence of greenish-black discoloration. Bouchert

observed a softening of the antral wall in an infant of two months, which he ascribed to cancerous cause.

In the chronic type of the disease a similar great change of tissue takes place. Zuckerkandl has demonstrated the presence of a microscopic change in the texture of the mucous membrane, namely, that it is often converted into a wavy, dense, connective substance consisting of comparatively few cells. "This organized (new) tissue may be compared," in the language of one writer, "to a fibrous degeneration." Hacke has noticed in the chronic type a frequent development or formation of polypi and mucous cysts, the occasion of gray patches on the membrane and a permanent thickening of the membrane itself. Mucous cysts are not infrequent concomitants of this stage of the disorder. Their development is supposed to arise merely from the bagging of the mucous tissue, or perhaps mucous layer (containing mucous glands) which holds within its fold the mucus thus secreted by the crypts. There are some observers still undecided whether to regard the cysts as mere sequelæ of the inflammatory involvement, with accompanying degeneration of the lining membrane, or to regard their presence as the real or primal cause. It might be said also that in these modifications of the tissue elements the function as well as the structure of the Schneiderian membrane becomes permanently impaired.

A brief treatment of the suppurative form will be had under etiology. The etiology or causation of empyema of the antrum depends upon numerous factors. The whole of the pathogenesis may be contained in the signification of the terms, "predisposing" and "exciting" causes. This order of classification has received proper naturalization from the best observers and writers. Hacke who examined post-mortem thirty cases in which death was caused by croup, diphtheria, measles, whooping-cough, scarlet fever and small-pox, discovered that the antrum had been involved in almost every instance. Weickselbaum examined sixteen cases in which death was the result of the grip and found that the maxillary and frontal sinuses had been involved by suppuration. A. Logan Turner in his book, page 143, says: "Inflammation and suppuration of one or more of the accessory sinuses, as a complication of acute coryza, influenza and the exanthematous diseases, are more prevalent than is generally supposed." In his

inestimable work Hajek asserts, in his observation of causes of empyema that influenza would rank foremost, and as the local agency diseases of the roots of the teeth next. This statement from such authority might serve to confirm the correctness of the reports made by dentists who record the frequent involvement of the maxillary sinus from infection of the roots of teeth, especially from bicuspids and molars. Grünwald is disposed, however, to carry this point a step further. On page 231 of his work, second edition, it reads as follows: "I have seen apparently healthy teeth, in which the most careful dentist was unable to find any mark of disease, keep up the suppuration. At last," he continues, "the presence of slight morbid change became apparent, while the removal of the teeth sufficed to cure at once a chronic fetid discharge that had persisted in spite of free opening into the cavity." He further remarks that "Even disease limited to the crown of a tooth is sufficient in my experience to exert an irritant action upon the adjoining parts." Under the caption of chronic suppuration in the antrum Grünwald continues: "Out of ninety-eight cases which I inspected, in fifty-nine I could ascertain nothing abnormal with the teeth; in fourteen cases caries of the crown was present, but the roots were unaffected; while in four out of the fourteen cases, besides empyema of the maxillary sinus, suppuration in other sinuses was found, thus showing that the teeth were not responsible in these cases." In another instance of fourteen cases he says: "I could certainly trace the origin to the teeth," and in eleven more he states the origin was doubtful.

Up to the present time my experience will scarcely admit my adding anything that has not already been mentioned. The fact that there exists a variation of opinion between the rhinologist and dentist as regards the most important and prolific cause of sinusitis, depends largely if not wholly upon their separate occupations. The dentist sees only the empyema developed as the complication of involvement from tooth structure, whereas the physician sees many of these cases, besides seeing also those developed from local secondary involvement and from infection disorders. My observation, however, is not restricted by means of these professional lines, as I see many cases accruing from disorders of the dental tissue, such as abscess and inflammatory condition of the alveolar process—those being referred to me by

dentists—while on the other hand, cases occurring during an attack of the infective disorders or from extension of diseases of the nasal structure come frequently within my view through amity of professional recognition. During a seizure of the grip I have invariably found marked soreness on palpation over the region of the cavity, and on one occasion a double empyema, acute in character, was manifest.

The nature of the maladies associated with the roots of teeth which are most likely to produce sinusitis—those having come under my observation—are circumscribed and suppurative inflammation of the soft tissue in the alveolar process in the advanced stage of pyorrhea alveolaris. It is a rule that pyorrhea at some period of its course, when not arrested by proper treatment, will cause this affection. For this reason if for no other every case of pyorrhea should be treated by a competent physician and operator. Grünwald believes that suppuration in the region of the peridental tissue may invade and set up an inflammation of the cavity by means of infective material conducted along the lymph channels.

I wish to speak also of another source of infection, namely, such as may result from troubles in the nose and accessory sinuses; for instance, suppuration in the sinuses themselves, ulceration of the turbinated (middle) body, acute rhinitis, polypus in the middle meatus, etc. The frontal and ethmoidal sinuses are so situated that if suppuration takes place in them, drainage of their contents being automatic, the purulent matter is very likely to enter the sinus through the ostium maxillare. Speaking of the treatment of this phase, Grünwald says that suppurative conditions at a site that may make infection or reinfection possible—such as, for instance, ulceration of the turbinated bodies—should as a matter of course engage the operator's earliest effort at treatment.

Polyps in the nose situated so as to close mechanically the fenestra of the sinus, thus preventing escape of the secretion, according to all writers serves as a vital cause of infection. The collection of mucus thus pent up will undergo putrefaction and set up inflammation. If I am not mistaken it was Hajek who alleged that if empyema existed without any external indication it was highly probable that the inflammation was caused by the presence and growth of polyps in the antrum.

Hypertrophic rhinitis and atrophic rhinitis, as well as deviation

of the septum of the nose, are infrequently causes of sinus involvement. I have a number of times seen the septum impinging firmly against the middle turbinated body. Besides acting as a pact of an obturator against the free purgation of the nose, it serves also to keep up a constant irritation.

This brings us to a consideration of the means and methods of treatment. Hajek has divided the methods of procedure—for study, at least—into conservative and operative. This classification fairly represents the procedure that I have observed for a number of years. In an article published in the September, 1899, number of the *American Journal of Surgery and Gynecology* I attempted to emphasize the practical importance of observing that distinction, and denominated the procedures as "major" and "minor." The major operation consisted of surgical intervention, and I advocated then what I shall now repeat, namely, that almost invariably the entrance into the antrum of Highmore should be made through the external surface of the bone, at a point just above the first molar. This plan of opening the cavity is known as Drake's method, but whether he selected this exact location I am not prepared to say. The conservative procedure, as my minor, consists virtually of irrigation, and this may be conducted through the natural orifice or through a small one artificially made for temporary use. Grünwald, however, if I understand him correctly, always advocates the operative measure, and he has without doubt good reason for commending it.

Practically all writers are agreed that the cause in a great measure must suggest the treatment. Where there are local disturbances in the nose—for example, polyps, ulceration, rhinoliths, infection from other suppurative points—proper measures must be employed to correct them. Keeping this fact constantly in mind, Hajek made it a rule to inspect the meatuses scrupulously as the first step in ascertaining the cause in order to apply treatment. As I have elsewhere noted, Grünwald is strict in recommending that where suppuration exists in two or more spaces the higher one in place of position should receive the earlier and more vigorous interference.

Where teeth are suspected as a cause, or where they are believed to be the only factor, treatment with respect to them receives varying consideration from different operators. Turner

would annihilate such without reserve, whether it could be ascertained or not that they were excitants, so long as they betrayed symptoms of disorder. Deducing from the extract quoted above, Grünwald would deal less radically. Where repeated trouble from the teeth has effected permanent alteration or necrosis of the bone I should recommend extirpation, otherwise not. In the event that pyorrhea has caused sinusitis from extraction or suppuration, much conservatism may be exercised, and during the early stages of pyorrhea efforts at preservation of the teeth should be made. The radical custom of promiscuously extracting a tooth, whether diseased or not, in order to secure problematic drainage of the sinus cannot be too strongly condemned.

Where the causative factor of sinusitis resides in the maxillary antrum or where permanent alteration of the membranous or osseous structure has taken place, the conditions themselves will arbitrate the course of procedure. In a chronic case of sinusitis, or where the affair has continued over a considerable period of time, both Hajek and Grünwald would display no hesitancy about entering the cavity through a considerable-sized hole in the wall, and moreover, if need be, for the purpose of exploration also. Both these operators elect to break in through the cuspid fossa. They argue that this route, besides being without question the most direct, offers less opposition to perfect inspection, and I cannot altogether agree with them. I believe that an entrance can be made through the external wall above the first molar tooth, or thereabouts, which will have several important clinical advantages over the other. The latter route offers the same scope to inspection or exploration, and accessibility to the removal of polyps, cysts —needing, perhaps, different shaped instruments—and at the same time it is devoid of the bad consequences affecting the impairment of the action of the levator angli oris muscle which follows the destruction of the bone that serves as an attachment for that muscle. We remember that this muscle has its origin in the cuspid fossa, and if much bone is removed impairment at least, if not total loss of function, must necessarily follow.

At this point it may be well to make brief allusion to Cooper's method before proceeding with the manner of treatment. This method has but one merit in its favor, with many discredits, in comparison with the operation that I have suggested. Extraction

of a tooth in order to reach the sinus has possessed no other value than that of dissipating the cause when same was dependent on the tooth thus removed. Extraction for the purpose of drainage has caused much disappointment, for in many cases thus treated the patient failed to secure more than temporary improvement, and to this was added in other cases the dissatisfaction of having a permanent hole in the maxilla.

Coming back to our original procedure, I might say that is possesses the advantages of letting one see what exists in the space, and at the same time allowing curettage, with internal inspection, for often small foci of necrosis of bone are found on the floor of the cavity.

Having entered the antrum and done what is found necessary, I invariably pack the cavity with antiseptic gauze. The use of drainage tubes I believe to be an error, as it is responsible for too many permanent openings in the jaw. For temporary drainage, say of a week, the gauze serves admirably. There is no need for longer drainage if the operation has accomplished that for which it was undertaken, and if not it was a failure and needs repeating. I hardly ever continue the pack longer than a few days, and after that close the wound. Hajek speaks of leaving the gauze untouched for from three to five days, and in the chronic type of the trouble the gauze may be dispensed with after three or four days.

The minor procedure, or the conservative method of Hajek, involves the process of irrigation, and this may be resorted to in cases not due to any persistent cause, or of a rather transitory character. I most commonly conduct the irrigation through the ostium maxillare, employing a bulb syringe with a long nozzle, bent at the end. This instrument converts a fairly complicated technic into a comparatively simple one by serving the twofold purpose of canula and injector. With this I can feel the course necessary to be followed very certainly. When the opening is found I never let the opportunity escape without doing complete work, applying more or less force to the stream as I think necessary. In performing the irrigation method, Grünwald introduces the solution through an orifice that he makes with a puncture below the inferior turbinated body near its anterior extremity. As a solution I have used, in proper dilution, glyco-thymoline, formalin, hydrodionid, carbolic acid, boracic acid, salt solution, etc., and they all have answered the purpose very well.—*Era.*

The Dental Digest.

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At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

PROPER COMPENSATION FOR DENTAL SERVICES.

In this issue we publish an article by Dr. Cigrand, in which he shows that our annual income is an important element in dental progress, and that if dentists wish to command the same respect and consideration which the public bestows upon other professional men they must place a proper value upon their services and not be content with the mere pittances that some of them accept. He makes a very good point when he demonstrates that because the practice of dentistry is largely mechanical and manual it is necessary for those who follow it to attend the various dental meetings each year if they wish to keep abreast of the times and familiarize themselves with all the new devices and methods, since same can be properly understood only by seeing the actual procedure. These journeys of course mean a considerable outlay of time and money, and he might have added that dentists bear a heavy burden in their original equipment, which must be renewed and added to from time to time, and in the materials which they use in operations, all of which expenses are escaped by the other professions. This is adding insult to injury, for not only are dentists the poorest paid of all professional men, but their expenses are the highest. We agree with almost all the statements which Dr. Cigrand makes, but when he names a period of fifty years of usefulness for the average practitioner we must take decided issue. It is undoubtedly true that some men are still in the practice of dentistry at the age of seventy years and over, but they are rare exceptions, and probably have not one-fifth the number of clients that they had twenty or thirty years previous. Other professional men may practice longer

than dentists, because the brain remains clear and active after the hand has lost its steadiness and cunning and the eye the keen power necessary to perform dental operations. Nevertheless we find dentists working because they must long after other professional men have retired on a competence.

A great many causes may be ascribed for the present deplorable state of affairs, but the profession itself must bear all the blame. In the first place, the majority of dental practitioners seem wholly satisfied with their condition and make no effort to better same. In the second place, they do not stop to consider that dentistry is a younger profession than either law or medicine, that the public is consequently not so familiar with it and the benefits which it confers, and that the great majority of the community gain all their knowledge of our calling from the grossly misleading advertisements of the dental parlors. They do not appreciate the difference between good and bad dental service because the average dentist does not take the trouble to teach his patients how essential sound teeth are for their well-being. A campaign of education should be carried on along this line in each dental office and every dental society in the country should take steps to educate the people in its territory. In the third place, dental practitioners do not properly value their own efforts, and the public is not going to think one bit better of their services than they themselves do. A few individuals, who seemingly wish to pose as superior beings, always take the stand that it is unethical for dentists as professional men to consider the question of fees. We certainly cannot claim to be more ethical than lawyers and physicians, and they not only charge fees commensurate with services rendered, but the community thinks all the more of them for so doing. So long as dentists are willing, as a large number of them are, to extract a tooth or put in an amalgam or cement filling for 25 cents, the same price that the barber charges for a hair-cut, they must expect to be put in the same class. Many argue that competition is much keener than it was a few years ago and that the number of dentists has increased more rapidly than the demand for dental services. Granting for the sake of argument that this is true, the majority of the profession in their effort to remedy it have adopted and are following out a suicidal policy. The very fact that competition may decrease the number of clients is all the more reason why proper fees must be charged if

the dentist is to exist. It has been often and truly said that the same energy and effort which are required to make a success out of dentistry would accomplish a great deal more in a number of other lines, and this will be remedied only when members of the profession cease to be content with a tithe of what their services are worth. Finally, even though dentists charge only a fraction of what they should, they are willing to let their bills run longer than are men in any other calling. All business houses collect monthly and the community expect nothing else. Furthermore, they pay their bills much more cheerfully at the end of each month than they would at the end of six or twelve months, when the goods purchased had been worn out. This is human nature and the principle applies even more strongly to dental services than to material commodities. Of all obligations the dental bill is usually the last to be met, and of all professional services those in our line are the least appreciated. This is due to the facts cited above and to the dentist depreciating his services in the eyes of his patients by usually not rendering his bills until some time after the work has been completed, and then letting them run indefinitely. If business men collected three months after the goods were delivered their losses would be very large, and if six months later, a large number of them would be forced into bankruptcy, yet dentists, who as a class never lay up anything for the future as does the average business man, will not recognize the folly of their present unbusiness-like and unprofitable methods and follow the example of those who have made a success in business and in other professions. Let us not blind ourselves to these glaring faults in the conduct of our affairs, but strive to put dentistry on the high plane which it deserves by correcting same.

Notices.

NORTHERN IOWA DENTAL SOCIETY.

At the eleventh annual meeting of the Northern Iowa Dental Society, held at Decorah, Sept. 12-13, 1905, the following officers were elected: President, C. L. Topliff, Decorah; Vice-President, J. D. Welsh, New Hampton; Secretary, C. N. Booth, Cedar Rapids; Treasurer, F. D. Miner, Oelwein. Cedar Rapids was chosen as the next meeting place.

NORTHERN ILLINOIS DENTAL SOCIETY.

The eighteenth annual meeting of the Northern Illinois Dental Society will be held at Elgin, Oct. 18-19, 1905. All dentists of Northern Illinois are cordially invited to meet with us.

A. M. HARRISON, Secy., Rockford.

SOUTHWESTERN IOWA DENTAL ASSOCIATION.

The ninth annual meeting of the Southwestern Iowa Dental Association will be held at Creston, Oct. 10-11, 1905. The profession in this and neighboring states are cordially invited to meet with us.

GEORGE BROOKS, Secy., Greenfield.

KANSAS CITY ODONTOGRAPHIC SOCIETY.

At the fourteenth annual meeting of the Kansas City Odontographic Society, held Sept. 23, 1905, the following officers were elected: President, W. T. Stark, Kansas City; Vice-President, F. O. Hetrick, Ottawa, Kan.; Secretary-Treasurer, J. P. Root, Kansas City.

FOX RIVER VALLEY DENTAL ASSOCIATION.

The Fox River Valley Dental Association met at Fond du Lac, Wis., Sept. 15, 1905, and elected the following officers: President, T. A. Hargrove, Fond du Lac; Vice-President, A. J. DuBois, Neenah; Secretary, May S. Hastings, Oshkosh; Treasurer, W. L. Conkey, Appleton. The next meeting will be held at Neenah, Wis.

DISTRICT DENTAL SOCIETY OF ILLINOIS.

At the annual meeting of the District Dental Society of Illinois, held at Quincy, Sept. 27, 1905, the following officers were elected: President, J. W. Marsh of Warsaw; Vice-President, O. M. Daymude of Monmouth; Secretary, H. W. McMillan of Roseville; Treasurer, J. M. Evey of Monmouth. Monmouth was chosen as the place of meeting next year.

NORTHERN INDIANA DENTAL SOCIETY.

At the annual meeting of the Northern Indiana Dental Society, held at Logansport, Sept. 19-20, 1905, the following officers were elected: President, Otto U. King, Huntington; Vice-President, F. M. Bozer, Logansport; Secretary-Treasurer, S. A. Bell, Hammond; Superintendent of Clinics, L. A. Salisbury, Crown Point. Hammond was selected as the next meeting place.

THE JENKINS SOCIETY.

Sept. 1, 1905, The Jenkins Society was formed with twenty-six charter members, and the following officers were elected: President, W. I. Brigham, So. Framingham, Mass.; Vice-president, R. S. Miller, Philadelphia; Secretary-Treasurer, B. C. Guile, Penn Yan, N. Y. The objects of the organization are to disseminate information regarding the use of porcelain in dentistry and to encourage, by demonstrations, its proper employment.

The annual dues are $1, and will be used to defray the expenses of publication and distribution of new literature on porcelain. The society is to be international in character, and any dentist in good standing who is interested in porcelain work is eligible to membership. All applications should be addressed to the undersigned.

B. C. GUILE, Secy.-treas.,
Penn Yan, N. Y.

PROVINCIAL DENTAL ASSOCIATION.

The Provincial Dental Association met at Halifax, Can., Sept. 6, 1905, and elected the following officers for the ensuing year: President, S. G. Ritchie, Halifax; 1st Vice-president, W. H. Beckwith, Halifax; 2d Vice-president, H. L. Mitchener, Mahone Bay; Secretary, F. W. Ryan, Halifax; Executive Committee, E. A. Goodwin, Glace Bay; S. G. Ritchie, Halifax; W. H. Beckwith, Halifax; H. L. Mitchener, Mahone Bay; F. W. Ryan, Halifax.

OHIO STATE BOARD OF DENTAL EXAMINERS.

The regular semi-annual meeting of the Ohio State Board of Dental Examiners will be held in Columbus, Nov. 28-30, 1905, at the Hartman Hotel. Applications for examination should be filed with the Secretary by Nov. 18. For further information address

H. C. BROWN, Secy.,
185 E. State St., Columbus.

STEPHENSON COUNTY (ILL.) DENTAL SOCIETY.

The Stephenson County Dental Society held its annual election of officers at Freeport, Sept. 25, 1905, with the following result: President, E. H. Place, Freeport; 1st Vice-President, W. E. Tucker, Lena; 2d Vice-President, J. F. Canode, Mt. Morris; 3d Vice-President, S. H. Matter; Secretary, W. T. Best; Treasurer, L. H. Matter; Librarian, E. H. Allen; Censors, Drs. Tucker, Saucerman and Pellet.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

A meeting of the Massachusetts Board of Registration in Dentistry for the examination of candidates will be held in Boston, Oct. 25-27, 1905. All applications, together with the fee of $20, if first examination, must be filed with the Secretary on or before Oct. 18, as no application for this meeting will be received after that date. Hereafter candidates for second and subsequent examinations will be required to fill out an application blank and forward it to the Secretary as above. Every candidate must be 21 years of age. Application blanks may be obtained from the Secretary. Temporary licenses are never granted. The fee for the third and subsequent examinations is $5.

G. E. MITCHELL, Secy., Haverhill.

DENTAL COMMISSIONERS OF CONNECTICUT.

The Dental Commissioners of the State of Connecticut give notice that they will meet at Hartford, Nov. 8-10, 1905, to examine applicants for license to practice dentistry and for the transaction of any other proper business. Practical examination in operative and prosthetic dentistry will be held Nov. 8. The written theoretical examination will be held Nov. 9-10. All applicants should apply to the Recorder for proper blanks and the rules governing examinations. Applications must be filled in and sworn to and, with fee, filed with the Recorder on or before Nov. 1.

GILBERT M. GRISWOLD, Recorder, Hartford.

NEW JERSEY STATE DENTAL BOARD.

The New Jersey State Board of Registration and Examination in Dentistry will hold its semi-annual meeting in the theoretical branches in the Assembly Chamber of the State House in Trenton, December 12-14, 1905. Session begin promptly at 9 a. m. each day. Practical operative work at the office of the examiner in practical operative work, Dr. C. S. Stockton, 22 Central Ave., Newark. Practical prosthetic work at the office of Dr. A. Irwin, 425 Cooper St., Camden. All practical work appointments secured from the examiners of those branches. Applications must be in the hands of the secretary two weeks prior to the examination.

CHAS. A. MEEKER, Sec'y, 29 Fulton St., Newark.

LATEST DENTAL PATENTS.

795,270. Dental obtunder, Charlie A. Damon, Fenton, Mich.
795,494. Cutter for toothpick machines, Harry A. Dorr, Providence, R. I.
795,754. Dentists' tooth clamp, Robert E. Barton, St. Louis.
796,120. Dental matrix, Theodore Green, Ridgway, Ill.
796,394. Toothpick machine, Howard E. Barlow, Providence, R. I.
796,980. Toothbrush, Robert D. Andrews, Brookline, Mass.
797,106. Hand-operated dental tool, Charles P. Gray, Cincinnati.
797,270. Tool for dental operations, Rudolf Dreher, Idar, Germany.
797,312. Artificial tooth, Henry P. Osborn, Bayonne, N. J.
797,423. Toothpick, Robert R. Freeman, Nashville, Tenn.
797,515. Metallic-backed tooth, Wm. C. Hughes, Pittsburg.
797,684. Dental instrument, Wm. E. Harper, Chicago.
799,495. Porcelain tooth-facing, Leon L. Poston, Council Bluffs, Iowa.
799,724. Dental tool, Adam W. Feltmann, Chicago.
799,811. Obtunding apparatus, Crittenden Van Wyck, San Francisco.
799,937. Dental crown or plate-swaging device, Joseph A. Reid, San Francisco.
799,972. Dental chair, Frank E. Case, Canton, Ohio.
800,033. Stand for teeth and nail brushes, tobacco pipes, etc., Wilhelm Ullrich, Offenbach-on-the-Main, Germany.
800,093. Dental device, Wm. S. Filley, Montpelier, Ohio.

News Summary.

W. H. HUNTER, a dentist of Cincinnati, died September 29, 1905.

H. J. BALCOM, a dentist of Buffalo, N. Y., died September 16, 1905.

W. P. INGLISH, 35 years old, a dentist of Vacaville, Cal., died September 25, 1905.

E. E. VAN VLECK, a dentist of Charleston, W. Va., was found dead in his office September 13, 1905.

DELOS B. DENNIS, a dentist of Talbotton, Ga., died suddenly at Tallulah Falls, Ga., September 6, 1905.

C. B. STAPLES, 75 years old, a dentist of Merrillan, Wis., died September 11, 1905, after a short illness.

HUDSON R. HURD, 85 years old, in active dental practice 55 years, died September 6, 1905, at Cleveland.

GEORGE E. NETTLETON, 58 years old, a dentist of New London, Conn., died suddenly September 6, 1905.

M. S. BEEBE, 65 years old, a dentist of Centralia, Wash., died suddenly of typhoid fever September 28, 1905.

JAMES NORDLUND, 36 years old, a dentist of Oakland, Cal., died suddenly September 27, 1905, from heart disease.

J. C. KIRBY, a dentist of Bridgeton, N. J., for nearly forty years died from heart disease September 23, 1905.

URIAH HARMON, 78 years old, a dentist of Chatham, N. Y., died September 6, 1905, from the effects of an operation.

HENRY H. BOULTER, 53 years old, formerly a dentist of Chicago, died at Pensacola, Fla., of yellow fever October 3, 1905.

CYRUS H. HARDY, 71 years old, for many years a dentist in Portland, Me., died at Malden, Mass., September 11, 1905, after a long illness.

NEVER TOO OLD.—We are never too old to learn, but lots of us are too young to realize it.

FIRES.—F. A. Woodmansee, Ft. Madison, Ia., Sept. 25; loss $1,200, fully insured.—Frank R. Holmes, Calais, Me., loss $800, $400 insurance.

LAZY.—There are people too indolent to be healthy; literally too lazy to live.—Butler. At least too lazy to be long-lived.

USE YOUR WORK (says *Success*) as a tool to develop the strong points of your character and to eliminate the weak ones.

WARTS.—If you want to remove a wart without a scar (says the *Surgical Clinic*), apply once a day a supersaturated solution of potass. bichromate.

BURNS.—A saturated solution of washing-soda allays the pain of burns probably better than any other immediate application.—*Therapeutic Review.*

ORTHODONTIA AND ORTHOPEDIA OF THE FACE. By Victor Hugo Jackson, M.D., D.D.S., Member of the National Dental Association; Professor of Orthodontia, Dental Department, University of Buffalo; Fellow of the

New York Academy of Medicine; Member of American Medical Association. Philadelphia and London: J. B. Lippincott Company, 1904. Price, $5.

"TEETH DECAY as the brain develops," says a scientist. Rot! A man with any kind of brain development won't let his teeth decay.—*Chicago Journal.*

ACCIDENT.—Sept. 23, while he was bending over a lamp doing some soldering, it exploded and severely burned A. O. McLaughlin, a dentist of Cortland, O.

USELESS.—"Will be back in an hour," read a card on a not over-busy dentist's door. The envious rival wrote underneath, "What for?"—*New York Tribune.*

A PAST MASTER.—"Dr. ———'s new position is called 'past master in surgery,' and it gives him the rank of lieutenant on the training ship Dorothea."—*Daily News* (Chicago).

NEURALGIA OR MUSCULAR PAIN.—Guaiacol mixed with an equal part of glycerin and applied over the seat of neuralgia or muscular pain will often give quick relief.—*Medical Summary.*

SENT TO PENITENTIARY.—According to newspaper report, E. R. Baughton, formerly a dentist of Newport News, Va., was sent to the penitentiary Sept. 22 for one year for theft. His downfall was caused by drink.

TO BEND A CROWN-POST.—Grasp the post with a pair of crown-contouring pliers. The convex jaw of the pliers forces a portion of the post into the concave jaw, thus bending it without strain on the crown.—*American.*

ILLEGAL PRACTITIONERS.—Sept. 18 a man at Paducah, Ky., was indicted on three counts for the illegal practice of dentistry.—Sept. 26 a man at Rochester, N. Y., was arrested for practising dentistry without a license.

GRANT MOLYNEAUX, a prominent dentist of Cincinnati, has, according to newspaper report, suffered a nervous collapse and is now taking treatment at a sanitarium. It is thought and hoped that he will soon recover.

DIVORCE.—Aug. 29 Matilda Klopp brought suit for divorce against her husband, Charles E. Klopp, a dentist of Naperville, Ill. She alleges that he sent her away on a visit, and then disposed of his practice and eloped with the office girl.

NOTES ON DENTAL PORCELAIN.—A Practical Treatise, Especially Devoted to the Interests of the Beginner. By V. Walter Gilbert, D.D.S. Philadelphia: The S. S. White Dental Manufacturing Company. London: Claudius Ash & Sons (Limited), 1905.

PRACTICAL POINTS.—Readers in this age want most to know how things are done, and they want to be told in the shortest possible way, in the most vivid language. Cut down your long-winded articles and make them crisp enough to be read before breakfast.—*Review.*

LIME WATER FOR VISCID SALIVA.—M. in *Review.* In patients whose saliva is viscid and tenacious, and where the teeth are covered with glutinous material, a mouth wash of lime water—procured at the drug store—will clear up the condition and relieve the difficulty better than anything. The constant use of lime water in such mouths will eventually change the char-

acter of the secretions and render the mouth and teeth more easily kept clean.

INCREASE OF INSECTED AREA.—"Larger than these two is the increase of the insected area over that of last February. . . . All stories to the effect that vaccine lymph is secured in any other manner are the products of ignorance or willful misrepresentation."—*Covington* (Ind.) *Friend.*

FRACTURED EDENTULOUS JAW.—In edentulous cases of fracture there is usually a plate that was worn at the time of the accident. This makes a beautiful interdental splint, and solves the difficulty of adjusting the parts and the delay of making a splint for the case.—J. D. PATTERSON, *Cosmos.*

FARMING AND PHARMACY.—A Bill relating to Pharmacy was referred in the New Jersey Legislature to the Committee on Farming & Farm Products. A Bill on Pharmacy in the Pennsylvania Legislature was referred to the Committee on Vice and Immorality.—REMINGTON, IN *Alkaloidal Clinic.*

REPAIRING PUNCTURES IN RUBBER DAM AFTER ADJUSTMENT.—Dr. J. V. Conzett in *Review.* Take a piece of surgeons' adhesive plaster of the proper size, slightly warm it and cover the puncture. It will effectually seal the opening. I got this idea from Dr. J. B. Pherrin, and believe it is original with him.

ASSURED OF IT.—Dentist (who has pulled the wrong tooth)—"I see how I made the mistake. I counted the molars from the back instead of from the front. You don't seem to have cut your wisdom teeth yet, young man."

Groaning Patient—"That's evident from the choice I made of a dentist."—*Chicago Tribune.*

IDENTIFIES BY THE TEETH.—The body of a prominent insurance agent of Des Moines, Ia., was recently found in the river, and was so mutilated that it was impossible to identify it. As a last resort his dentist was called in, and after making a short examination of the teeth and mouth completely identified the body.

A NOBLE EXAMPLE.—According to the Sheldon, Ia., *Mail* of recent date, "Mrs. Blank is assisting her husband in his dental practice, and from now on will be at the office each day. Dr. Blank's large practice keeps him closely confined to his office, and the generosity of his wife will be of great assistance to him."

NEW SERUM.—Horne reports the discovery of a new serum obtained from the jackass and the billy goat, which he gives to people deficient in mental firmness. Before going any further with this thing we (*Alkaloidal Clinic*) want to know right here whether it causes the patient to determine that he will or will not pay his doctor. When this is settled we may give our readers some more information on this remarkable discovery.

LAW AGAINST THE USE OF COCAIN.—A bill has been introduced in the New York State legislature which goes farther (*Jour of Inebriety*) than any other for the prevention of the use of cocain. It forbids the sale of cocain, either at wholesale or retail in any form or in any proprietary preparations, except on the written prescription of a duly registered phy-

sician or dentist, and any preparation of cocain or its salts must have a label affixed to the bottle, giving the exact contents of the mixture.

To Clean Saliva-Ejector Tubes.—If a drop of lactic acid is put in the glass tube and swabbed out with a bit of cotton fastened on binding wire, it will dissolve the salivary deposits in the tube, solving the difficulty in keeping the glass tubes bright and clear.—R. E. Gilson, *Gazette.*

Spots in Pink Rubber Facing.—F. A. Graham in *Review.* When the red or black rubber is forced through the pink and shows in front, the spots may be drilled out with an inverted cone bur and the cavities filled with pink gutta-percha. It will harmonize with the pink rubber and not be conspicuous in the mouth.

It Was No Bath She Wanted.—They were sailing, not far from land. An ugly puff of wind, coming suddenly, sent their tiny sail flying in tatters, and they drifted. She cried for help. He essayed to calm and reassure her. "We will surely be washed ashore," he said. "Sir!" said she. "I will wash myself ashore! What I want now is to get there!"

Temporary Filling.—Absorbent cotton saturated with cement mixed to a creamy consistency makes an excellent temporary filling material which will last for months. If required for only a short time, nearly fill the cavity with dry cotton before inserting the above. This will facilitate the subsequent removal of the filling.—R. E. Sparks, *International.*

Pulp Protection.—Coat the cavity walls with thin varnish and partially fill with cement, completing with porcelain, gold or amalgam, sufficiently to protect the underlying cement. The varnish protects the dentinal fibrillæ from the irritating effects of the cement, the cement protects the pulp from thermal shock, the gold or amalgam protects the cement from disintegration. —F. G. Worthly, *Western.*

Damage Suits.—Sept. 2 a man at Woonsocket, R. I., brought suit for $500 against a dentist, alleging that although he stipulated and the dentist agreed that his teeth should be filled with gold, something else was used and he has been permanently injured.—Sept. 12 a woman at Tacoma, Wash., brought suit for $4,000 against a dentist, alleging that in extracting a third molar he broke off the crown and left the roots in the jaw, resulting in inflammation and much suffering.

Avenged at Last.—"I'd like that tooth, please," said the small boy, after the dentist had extracted the small torment.

"Certainly, my little man, but why do you want it?" queried the dentist, handing it over.

"Well, sir," responded the gratified boy, "I'm going to take it home and I'm going to put it on a plate and I'm going to stuff it full of sugar, and then" (with a triumphant grin) "I'm going to watch it ache."—*The Doctor.*

Sterilizing Root-Canals.—In from ten to fifteen minutes the electrolytic action of a constant galvanic current of from one to two milliamperes suffices for sterilizing completely root-canals inaccessible to instrumentation. Injecting a seventy-five per cent aqueous solution of salt, thoroughly sat-

urating the canal contents, gives a good conductor. If the anode or positive pole is made of platinum it will deposit chlorin, oxygen and hydrochloric acid, these ions promising a decided anti-bacterial effect.—DR. KURT HOFFENDAHL, *Cosmos.*

CATAPHORESIS IN THE TREATMENT OF PYORRHŒA ALVEOLARIS.—Cataphoresis affords an effective way of saturating the tissues with antiseptics by virtue of the osmotic effect brought about; it is the most thorough method of destroying bacteria; it stimulates the tissue to repair and the bone to reform about the roots of the loosened teeth. However, no results will be attained of a permanent nature if the salivary deposits are not completely removed. Argyrol is advised when nitrate of silver would be indicated.—E. STURRIDGE, *Brit. Dental Jour.*

CAPPING A PULP.—C. J. Hadley in *Review.* I do not advise capping pulps when fully exposed, but when nearly so or when the case indicates, I always use cement, and never gutta-percha or any substance that will not set hard and remain rigid. I mix chinosol with the cement, taking a tablet and shaving a small quantity into the liquid, and then mix the cement in the ordinary way. Care should be taken not to cause pressure while flowing the cement over the pulp. I have been using this preparation for over a year, and have not found anything that will equal it as a mild, antiseptic, non-irritating capping material.

BATHING IN JAPAN.—Clarence Ludlow Brownell in his recently published book, "The Heart of Japan," says that the death rate for children is lower in Japan than it is in Europe or in America. This (says the *Medical Record*) is as it should be, in a country where the houses are off the ground a foot or two and have no cellars, and the air inside is as fresh as it is out; where, too, in such places at least as Tokio every one bathes and has a good scrubbing every day. From 800,000 to 1,000,000 persons go to the public baths of the capital daily, and there are tens of thousands of private baths besides. That is a good showing for a city with a population of less than 2,000,000.

COLD AND NIGHT AIR.—A patient 'phoned for an appointment (says the *Dent. Off. and Lab.*). "To-morrow at 12:30," was 'phoned back. He came and on taking the chair said: "Queer thing. Yesterday when I 'phoned you, this tooth (pointing to a bicuspid) was sore as the devil. Now it's all right, but the one next is as sore as the other was yesterday. What makes it? Cold?"

The dentist suggested "cold" as a possible cause.

"I must have got it," mused the patient, "on my way home *from* dinner Saturday night. I walked, thinking the air and exercise would do me good, but now I think a man in my condition should have gone home in a hack."

CURE FOR HICCOUGH.—A young girl suffered for four days without cessation from singultus, about thirty spasms to the minute, the attack being due apparently (*How to Live*) to some gastric disorder. When she put out her tongue for a few seconds it was found the hiccough ceased. She was then ordered to stick out this member at regular intervals for a few

minutes, at the termination of which only a few slight spasms followed. She was then ordered to repeat, when the singultus ceased altogether and did not return. It therefore would seem to be proper to try continuous or rhythmic traction of the tongue in these cases.

CHEMICAL COMPOSITION OF THE BODY.—A French chemist of a particularly inquiring turn has determined by experiment that the body of an average man of about eighty kilos, has all the chemical elements represented in the yolk and white of twelve hundred ordinary-sized eggs of the common hen. Properly reduced, such a body would furnish 96 cubic meters of gas and sufficient hydrogen to fill a balloon with an ascensional force of 70 kilos. Normally the human body contains iron sufficient to make seven large nails, fat for thirteen candles, carbon for sixty-five gross of pencils, phosphorus to tip eight hundred and twenty thousand matches, together with the constituents of twenty teaspoonfuls of salt, fifty-nine lumps of sugar, and forty-two liters of water.

ACTINOMYCOSIS.—Abscesses in connection with actinomycosis first manifest themselves as a dusky hardness of the skin, unaccompanied as a rule by pain or rise of temperature, and causing inconvenience only when by infiltration they impair the function of muscles. One or more soft spots appear in the indurated area, and between these soft spots the skin appears to be drawn in. If left alone the soft spots open spontaneously, giving the area a sort of honeycomb appearance. If incised, in the very small quantity of pus that escapes there can often be recognized the small spherical masses characteristic of the affection—sulphur grains, as they have been called—sometimes bright yellow, sometimes a dull yellowish-white, but sometimes again only small and colorless.—THOMAS H. KELLOCK, *Brit. Jour. Dent. Sc.*

FATALITIES.—Sept. 22 a priest died at Indianapolis from blood-poisoning caused by a decayed tooth.—Sept. 20 a man at Greenville, O., 62 years old, had five teeth extracted by a dentist, and died an hour later from neuralgia of the heart. He was subject to heart trouble and refused to taken an anesthetic, as suggested by the dentist.—Sept. 12 a man at Zanesville, O., 28 years old, died from hemorrhage, which had continued since Aug. 28, when he had a tooth pulled. About a year ago he contracted a blood disease, and this made the efforts of physicians to stop the hemorrhage futile.—Sept. 12 a woman at Bristol, Va., died after the extraction of several teeth. Physicians stated that she had no organic trouble, and as no anesthetic was used that the shock and pain of the operation caused her death.

ROBBERIES.—A. L. Vancrom and Dunwoodie McKean, Alameda, Cal., Sept. 24, $2 and $18, respectively.—Dr. Abernathy, La Salle, Ill., Sept. 23, $30 worth of gold.—R. F. Lucas, South Bend, Sept. 28, $125 in gold and a quantity of teeth.—N. F. Hazlett, Marion, Ind., was robbed of three forceps, valued at $7.50, Sept. 22. The thief sold them to two dentists of the town at $.50 each.—R. E. Nelson, Leavenworth, Kan., Sept. 4, $40.—J. A. Welch and Roy Alvord, Battle Creek, Mich., both suffered heavily by theft Sept. 28.—Charles J. Spriggs, Rome, N. Y., Sept. 9, $15.—Lyman

& Thompson, Troy, N. Y., Sept. 10, $350.—Half a dozen offices at Williamsport, Pa., were entered Sept. 8, and an average loss of $20 was the report. —J. W. McKinnon, York, Pa., Sept. 7, $100 worth of gold and a quantity of teeth.—J. P. Coult, Scranton, Pa., Aug. 13, $25.

All or Nothing.—Jenkins—"What I told you was that Dr. Price-Price never insisted upon a fee for his advice from those who couldn't afford to pay him."

Markley—"Well, when he got through with me he asked me if I had any money and I said 'Yes.'"

Jenkins—"Well?"

Markley—"Well," he said, "I'll take it."

Lancing an Alveolar Abscess.—E. D. in *Review.* Sometimes this is a painful operation with the ordinary hand lancet. The tubular lancet made for the engine is in many cases much preferable, and if manipulated properly is much less painful. It should be kept very sharp, and previous to using should be dipped in carbolic acid, 95 per cent. Revolving the engine rapidly, the end of the tube should be gently pressed to the gum, and the pressure very gradually and delicately increased, so that the tube will cut without appreciable force being exerted on the abscess. In this way a deep abscess may frequently be reached with almost no pain, and with less apprehension on the part of the patient than if an ordinary lancet is used.

Assault to Commit Rape After Administering Chloroform.—The Supreme Court of Colorado says, in Harlan vs. People, where it affirms a conviction of a dentist of an assault to commit rape, that it is uniformly held that one who carnally knows a woman while she is in a state of stupefaction is guilty of rape. And there can be no doubt that, if the accused in this case had at the time administered chloroform for no unlawful purpose, yet, if he afterward formed the design and purpose to have sexual intercourse with the woman while she was under the influence of chloroform, and while she was in such a condition from the effects of the chloroform that she was unable to remonstrate or resist, and that while harboring such intention he undertook to have sexuaal intercourse with her, he was guilty of an assault with intent to commit rape, although the assault was one without violence, and although he desisted before accomplishing his purpose.—*Jour. A. M. A.*

Lowering of the Arterial Pressure Reliable Danger Sign in Chloroform Anesthesia.—J. Tissot of Paris has been studying on dogs the relations between the modifications in the arterial pressure and the toxic action of chloroform on the heart. The arterial pressure is a reliable index of the contracting power of the heart. We know that fatal accidents from chloroform are due to the toxic action of the drug on the heart or on the nerve centers controlling its action. He found that the dogs never displayed any threatening symptoms as long as the arterial pressure was above 100 mm. Hg, but respiratory arrest occurred whenever the pressure dropped to 60 mm. Cardiac syncope occurred if it fell near or below 50 mm. Hg.

The chloroformization in his experiments was always slow and gradual. Tissot believes that these data will be found to apply also to man, and that by watching the arterial pressure we will be able to detect impending danger long before it is revealed by any other sign.

STATES THAT INTERCHANGE.—Arkansas reports no interchange as yet, but Oklahoma reports interchange with Arkansas.

District of Columbia interchanges with New Jersey.

Florida interchanges with states whose laws are equal to Florida's.

Indiana interchanges with New Jersey.

Michigan interchanges with New Jersey.

New Jersey interchanges with Indiana, Michigan, North Carolina, Tennessee, Utah and Vermont, and by special agreement with New York.

New York interchanges with New Jersey and Pennsylvania.

North Carolina interchanges with New Jersey.

Pennsylvania interchanges with New York.

Tennessee interchanges with New Jersey.

Utah interchanges with New Jersey.

Vermont interchanges with New Jersey.—*Items of Interest.*

QUEER SURGICAL OVERSIGHT.—Says an exchange: "Such surgical accidents as the leaving of a forceps or a sponge in the abdomen during laparotomy are by no means unknown and every careful surgeon is alert to avoid them. The most remarkable accidental inclusion, however, is reported from Paris, where a young woman has started legal proceedings on account of the finding of a pair of noseglasses in her abdomen. It appears that a laparotomy was performed on her in America, and, her condition not being improved, a second one was performed in Germany. Still later the French physicians had the last innings and removed the eyeglasses from their peculiar position. The question is, who left them there? The natural presumption is that if they were left there at the first operation they should have been found at the second. There would seem to be a good chance for determining the question by testing the respective operators' eyes. While we comment on the matter, we do not vouch for the occurrence, as we have only the newspapers for our authority; no mention is made of it in our foreign exchanges."

SOLDER AND ITS MANAGEMENT.—Gold or silver solder seems to have a disagreeable habit of flowing where not wanted, not flowing where desired, and sometimes also "balling" up. These caprices may, however, be controlled very nicely by remembering that though influenced by gravity it inclines to flow after the flux and also to the point where most heat is concentrated. On the other hand, it avoids places covered by such materials as whiting, yellow ochre, or graphite. If the piece to be soldered is not heated sufficiently the solder will refuse to adhere, and will "spheroid" into a ball; therefore investment should be well and fully heated throughout before the blowpipe is turned on the solder. Very often too much flux is used—to the great danger of facings—and it is sometimes surprising how little dry borax will suffice provided it is applied on *top* of solder. Spaces (and the

most expert will sometimes have them) desired to be bridged with solder should be packed, not too tightly, with pellets of filling gold or scraps. Old platinum scrap or pins are very useful for this purpose. About the most convenient method of preventing the flow of solder to any point is to rub that point over with a (preferably soft) lead pencil.—THOMAS J. MCLERNON, D.D.S., in *Stomatologist.*

SALT.—Salt cleanses (*How to Live*) the palate and furred tongue, and a gargle of salt and water is often efficacious. A pinch of salt on the tongue, followed ten minutes afterwards by a drink of cold water, often cures a sick headache. Salt hardens gums, makes teeth white, and sweetens the breath. Cut flowers may be kept fresh by adding salt to the water. Weak ankles should be rubbed with solution of salt water and alcohol. Rose colds, hay fever, and kindred affections may be much relieved by using fine dry salt, like snuff. Dyspepsia, heartburn, and indigestion are relieved by a cup of hot water in which a small spoonful of salt has been melted. Salt and water will sometimes revive an unconscious person when hurt, if brandy or other remedies are not at hand. Hemorrhage from tooth-pulling is stopped by filling the mouth with salt and water. Weak and tired eyes are refreshed by bathing with warm water and salt. Public speakers and many noted singers use a wash of salt and water before and after using the voice, as it strengthens the organs of the throat. Salt rubbed into the scalp or occasionally added to the water in washing prevents the hair falling out. Feathers uncurled by damp weather are quickly dried by shaking over a fire in which salt has been thrown. Salt always should be eaten with nuts, and a dessert fruit salt should be specially made.

LIVER INDICTMENT.—A correspondent sends us (*Jour. A. M. A.*) a card, on one side of which is the following:

DR. —. —. ————,

DIPLOMATE OF

Biochemistry, Osteopathy, Psychology, Veterinary Medicine, Surgery and Dentistry.

At ———— Farm, Near ——— ———

I Restore Health to Man and Beast.

On the reverse side:

I can restore you to health from all your ailments of any nature, chronic or acute, without the use of poisonous medicines—but use only the substance from which the body is constructed. The germs, microbes, and so on, are neither the cause nor the result of the ailments, yet they are eternal life—God's own way of perpetuating health—and all the so-called diseases are but a breaking down of the cell tissues of the body, due to a defective liver, causing indigestion, which I can restore to perfect health with the tissue cell-salt.

CONSULTATION FREE.

Write or call on me at —— —— ——— Farm,

Near ——— ———.

BRAINS AND TEETH.—Alluding to a recent article by Sir Oliver Lodge, in which the writer gives it as his opinion that "the more brains one has, the less teeth one has—unless they are artificially provided," a writer in the *Westminster Gazette* is stimulated to break out into verse as follows:

"Belinda dear, once on a time,
My best beloved of pretty girls,
It was my wont to turn a rhyme
And say your mouth was full of pearls.

"In blissful ignorance of yore
I thought my compliment but truthful;
But knowledge grows from more to more—
Only the brainless now are toothful.

"So take a cab, Belinda dear,
Hie where the dentistry is painless.
Have out the pearls which now, I fear,
Are merely teeth to prove you brainless."

INFLUENCE OF FATIGUE ON ACCIDENTS.—Everyone knows that both body and mind are less alert during fatigue than when we are in full physical vigor. A curious connection between the two states is noted in the *Literary Digest*, and a cut is given "in which a continuous line represents the distribution into hourly totals of 2,065 accidents, of which 56,468 workmen were the victims in the Department L of Herault, while a dotted line shows a similar distribution of 5,534 accidents that happened to 240,407 workmen in nine departments around Toulouse." It is seen that the number of accidents increases progressively from hour to hour during the first half of the day; after the mid-day rest, in the first hours of the afternoon, the number is notably less than in the last hour of the morning. In the course of the second half-day accidents become hourly more numerous; the maximum number of accidents hourly toward the end of the second half of the day is notably larger than the corresponding maximum for the morning. The statisticians say that although fatigue is the inevitable consequence of all expenditure of energy, and although we cannot do away with it unless we abolish work, we can prevent it from reaching the degree at which its influence in the production of accidents is injurious. It would seem that a diminution in the number of accidents would result from interposing in the middle of each half-day a rest, not so long as that of the noon-hour, for the fatigue would then be less, but of a duration to be determined by divers considerations. This would only be applying to the mechanical labor of adults what has already been done for the mental work of children.

EXAMINING BOARD AFFAIRS.—The commission appointed by the governor of California to investigate the dental examining board of that state returned its report Sept. 16, finding, according to newspaper report, "the board is not guilty of crookedness, but declaring conditions therein are such as to destroy the usefulness of the body. All the members are blamed

for the inharmonious state of affairs, and the board is declared to have no future."—Sept. 29 the governor announced that on Nov. 12 A. L. LeGro of Three Rivers would be appointed for three years to succeed C. J. Gray of Petoskey on the Michigan Board.—Sept. 7 the governor appointed the following men as members of the Missouri Board: H. B. Purl, Kirksville; T. E. Turner, St. Louis; S. C. A. Rubey, Clinton; R. D. McIntosh, Monett; C. B. Coleman, Poplar Bluff.—Sept. 23 suits involving the state of Washington, the dental society of same, the examining board, the Seattle Dental Club, and many individual dentists, were begun in the Superior Court by two dentists, who allege that a conspiracy exists between the various defendants to prevent them from securing licenses to practice. Both men have been arrested several times for failure to have a license.—Sept. 18 Judge Tarrant of Milwaukee handed down a decision holding that the action of the Wisconsin Board in declaring the dental department of the Milwaukee Medical College not reputable was void. The attorney for the board immediately moved for a stay of execution to permit of the proceedings being taken to the Supreme Court for review, and a stay of 30 days was granted.

Ulceration of the Frenum of the Tongue.—This is a rare form of sublingual ulceration (says Mouchet in *Gaz. des Hospitaux*), which has been chiefly described by Riga of Naples, in 1881, and after whom the disease is sometimes named. In a mild form it occurs in infants between the ages of six to eighteen months. The characteristic feature of this ulcer is that it is solitary and usually unaccompanied by enlargement of the glands. There may be some salivation, but no impairment of the general health. A more serious form is observed in children suffering from gastro-enteritis. In these cases the symptoms are those of the abdominal condition, the ulcer being similar to that present in the milder form. The ulcer described by Riga resembles no other lesion except the ulcer of the frenum, which occurs in whooping-cough from the pressure of the lower incisors during the paroxysms of coughing. Little is known as to the nature of this condition, except its connection with gastro-enteritis in badly-fed children. When intestinal symptoms are absent the writer regards the ulceration as due to purely local causes, such as the mechanical irritation of the frenum during nursing, from pressure against the sharp border of the gum or lower incisors. In an infant who had suffered from this condition in its simple form for six weeks, the child's mother spontaneously pointed to the median lower incisor tooth as the cause of the ulcer. This tooth had been cut only some days before the ulcer was first observed, and had been so sharp and pointed that the mother had endeavoured to file it down at one side. As the ulcer did not improve after three cauterizations the writer removed the tooth, and healing took place in five days.

How We Hear Our Own Voices.—That a man does not hear his own voice as all the rest of the world hears it is shown by an interesting experiment described by Dr. L. Laloy in *La Nature* (Paris). Says this writer: If a person records on a phonograph a few sentences pronounced by him-

self, together with others by his friends, and causes the machine to reproduce these at the end of a brief period, it generally happens that he easily recognizes his friends' voices, but not his own. On the other hand, the friends recognize his voice perfectly. This singular fact proves that everyone hears his own voice differently from others.

As is remarked by Professor Exner, the difference must lie in the quantity of tone. It must be remembered that one hears his own voice not only through the air, as do his auditors, but across the solid parts situated between the organs of speech and those of hearing. The sound thus produced has a different *timbre* from that conducted to the ear by air alone. We may show this as follows: Take the end of a wooden rod between the teeth and pronounce a vowel continuously. Let the other end be alternately taken between the teeth and released by another person, who at the same time stops his ears. The latter will find that every time he seizes the rod in his teeth the sound becomes stronger than when it reaches his ear through air alone, and has a different quality. The experiment may be varied by applying a wooden rod to the larynx of the person observed, and touching it from time to time to the observer's own larynx. As in the preceding case, it will be found that its passage through a solid body augments the intensity of the sound and modifies its quality.

MARRIAGES.—E. W. Blaisdell, a dentist of Milwaukee, was married to Miss Mary Love Putney of Waukesha, September 20.—E. S. Chisholm, a dentist of St. Louis, was married to Mrs. May Godfrey of St. Louis, September 16.—G. L. Compton, a dentist of West Milton, O., was married to Miss Anna Miller of West Milton, September 18.—William Lowell Curgill, a dentist of Liberty, Me., was married to Miss Lilla Merrow of Bangor, September 27.—Foster Oran Dudgeon, a dentist of Cleveland, was married to Miss Frances Eger of Cleveland, September 13.—Zelopheard Hand, a dentist of Millville, N. J., was married to Mrs. Mary Elizabeth Miller of Newark, September 6.—W. M. Huston, a dentist of Philadelphia, was married to Miss Rose Lee Collom of Philadelphia, October 2—S. M. Leeper, a dentist of Cambridge, O., was married to Miss Ida Naomi Allen of Cambridge, September 14.—Arley C. Lewis, a dentist of Philadelphia, was married to Miss Ora Bates Williams of Westfield, Mass., September 4.—Ira P. Norton, a dentist of La Porte, Ind., was married to Miss Blanche Ackerman of Lapeer, Mich., July 9.—J. E. Rogers, a dentist of Mattoon, Ill., was married to Miss Emma Heermans of Mattoon, September 5.—L. T. Sauerbrun, a dentist of Mansfield, O., was married to Miss Ora Lederer of New Washington, September 3.—Emmett Wilde Schackelford, a dentist of Durham, N. C., was married to Miss Frances Craddock Owen of Denniston, Va., October 11.—C. S. Smith, a dentist of Spring City, Pa., was married to Miss Anna McClellan of Latrobe, September 19.—T. W. Thomas, a dentist of Wilkesbarre, Pa., was married to Miss Laura Edith Williams of Pittsburg, September 12.—Walter L. Truett, a dentist of St. Louis, was married to Miss Mary A. Cin of St. Louis, September 27.